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FINANCE ENGINEERING COMMERCE

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FOREIGN LOAN CONTROL ASSAILED

By George Bronson Rea

KEEP THE AMERICAN BUSINESS MAN IN CHINA

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OUT OF KIMONO INTO OVERALL

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December, 1927
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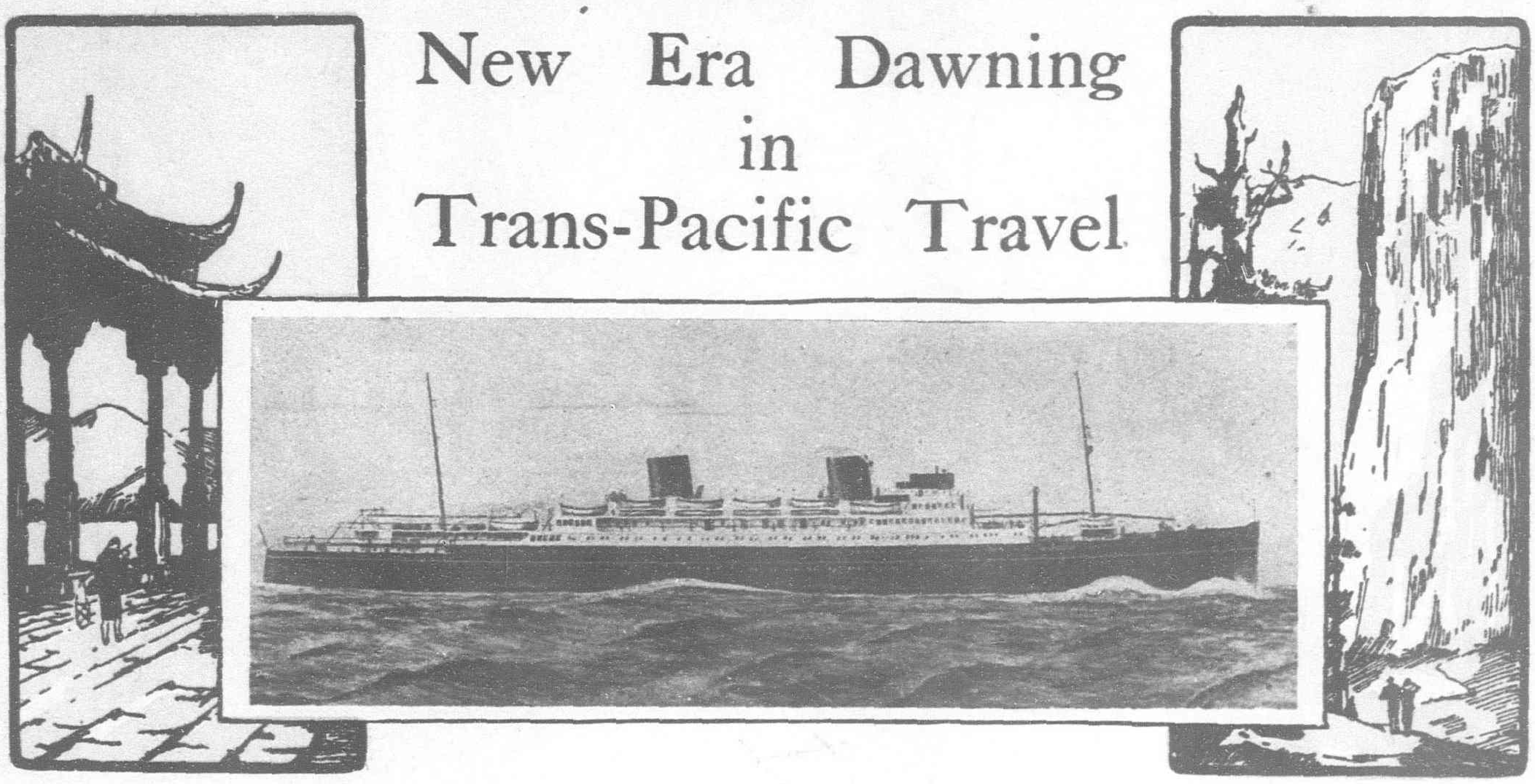

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The Far Eastern Review

ENGINEERING FINANCE COMMERCE

VOL. XXIII SHANGHAI, DECEMBER, 1927 No. 12

Foreign Loan Control Assailed

Consortium Principle Involved

By Geo. Bronson Rea

PRIVATE American loans to foreign interests have now reached the amazing figure of $13,000,000,000 with an additional $11,000,000,000 in Allied war-debts owed to the American Government. Many of these private loans are unsound and risky from the standpoint of sound investment and it is now generally admitted that many will never be repaid. It is pointed out that it is not only American aeroplanes which make the one way passage across the Atlantic, but our European loans as well. It is impossible for the debtor nations to repay both Government and private loans and a continuance of the unrestricted flow of private funds abroad, will eventually lead to such a demand for war-debt cancellation that some Administration may yield in order to ensure collection of a part of the debts.

America's sudden accumulation of wealth and her transformation from a debtor nation into the position of world banker has brought about keen competition amongst our financial houses for new foreign issues. We do not wait for business to come to us, but go abroad seeking it. "Last winter not less than fifty American banking representatives were camped in Rome or Milan hot foot after business," says Isaac F. Marcosson in his latest article on Italy. Security which would not be acceptable to British bankers has been welcomed by the American. It is claimed that several foreign loans recently floated in New York were first turned down by London and although the successful American bankers declare that it is simply a matter of sour grapes, the mere mention of the fact invites a closer scrutiny of our methods of doing business. If it is true that many of our private loans are unsound and may never be repaid, there are good reasons for the application of a more rigid system of control not only from the political but from the standpoint of sound investment. Under our system of government such control opening wide the door to favoritism could not be tolerated. About all we can do is to pass on the political merits of the transaction and leave the investment hazard to the judgment of the bankers.

This course is now being followed by our State Department. Following long established precedents created by European Governments in exercising control over the exportation of capital from their respective countries, the American Government since the war has insisted that all foreign issues be submitted for its approval. Since President Harding called the bankers together in conference in 1921 and the latter agreed to submit their prospective flotations to the State Department for inspection, it has been the rule of the Department to pass on the loans in the following stereotyped phrase:

"*You of course appreciate that, as pointed out in the Department's announcement of March 3, 1922, the Department of State does not pass upon the merits of foreign loans as business propositions or assume any responsibility in connection with such transactions, also that no reference to the attitude of this Government should be made in any prospectus or otherwise. . . . . I beg to state that, in the light of the information before it, the Department of State offers no objection to this financing.*"

Even this partial supervision of our foreign loans is now attacked as a flagrant example of dollar diplomacy and attention is called to the fact that the State Department's "approval" has been employed by enterprising salesmen to make their bonds more attractive and that many investors labor under the belief that Washington will either protect their investments by force or make up whatever loss they may suffer. In other words, the idea has been created that the State Department and the armed forces of the nation are to act as a collection agency, an impression the State Department has endeavored to forestall by the careful wording of its "approval."

At the same time the policy is being vigorously attacked in private by representatives of foreign governments in Washington on the ground that it is not only annoying to the countries they represent, but that it is too great a responsibility for a government to take in a country where such an immense amount of foreign financing, good, bad and indifferent is being made. Curiously enough, the French Ambassador is alleged to hold these views, overlooking that when Paris was the financial center of the world, no foreign loan could be issued without the full approval of the French Government.

All this controversy makes good campaign material for the outs, so we have Senator Carter Glass, Democrat from Virginia, and former Secretary of the Treasury in Wilson's cabinet, assailing the Administration for continuing a practice originated by Secretary Knox, repudiated at the outset of his term by President Wilson and then revived and firmly established with the full force of our diplomacy and finance as the key note of our China policy.

Senator Glass condemns the practice on several counts. He declares, that it is unconstitutional and without sanction of law, a usurpation of an authority by the Executive branch of the Government delegated by the constitution to Congress. He also contends that it is unwise from the standpoint of public policy because of its sinister possibilities and that it may lead American investors to believe that loans approved by the State Department are safe, while others are not. The challenge is bound to be taken up and we may look for an interesting airing of opinions this coming winter on this highly controversial subject. The American people have short memories and from the tenor of the press comments already published, it is quite possible that Senator Glass may succeed in obscuring the fact that the agreement reached at President Harding's conference with the bankers in 1921, was merely the continuance of a policy laid down and enforced by his predecessor.

The controversy is of special interest to the readers of "THE FAR EASTERN REVIEW," for, if the State Department assumes no responsibility in connection with the $13,000,000,000 loaned privately to foreign interests and, that no reference to the attitude of the Department can be made in any foreign loan prospectus, the bottom drops out of the China Consortium. The State Department cannot disassociate itself from this piece of so-called dollar diplomacy, as it was on its special invitation that the new combination was called into existence. International financial co-operation in China through the officially recognized and supported American Group in the Consortium stands to-day as part and parcel of American policy towards that country. It will be difficult and embarassing to reconcile the present stand of the State Department towards foreign loans with its commitments under the Consortium Agreement and it will be equally difficult to convince American investors why a principle which seems eminently justified when applied to China should not be extended to cover our loans in other backward countries. It may be pleaded that this is a special case. So it is but even though the Department's policy can be vindicated it carries with it certain obligations to the bond-holders which cannot be shirked.

The Consortium stands to-day as the major obstacle to the League of Nations tendering its friendly services to reconstruct China's finances. The League hesitates to approach China with any plan for reconstruction for fear that it may conflict with the Consortium program. Its leaders will not risk the humiliation involved in America's refusal to co-operate with it in a plan which, to succeed, must have American financial support. The American Government is committed to support the instrument of its own creation for the financing of China. We cannot accept a proposal from the League without a corresponding loss of prestige and the League will not hazard a snub by inviting us to co-operate with it in China.

We agree with Senator Glass, however, that the exercise of this unprecedented power may some day be so flagrantly prostituted as to result in a distressing scandal. We might add that from our own experience the exercise of this power when used to create a monopoly of financing in any particular foreign country brings undue hardships upon individuals who may have labored long and hard to bring about the same results from another less objectionable angle. It can be proved that much of China's present troubles can be traced to the vacillating policy of the Wilson Administration for, had President Wilson continued the Knox program of extending support to the American Group in 1913, China would have settled her own problems, eliminated spheres of influence and so consolidated the power of the Central Government over the entire country by the construction of new railways, that subsequent civil wars and revolutions would have been nipped in the bud. Wilson's withdrawal of official support to the American Group in March, 1913, effectively killed Dr. Sun Yat-sen's practical railway scheme at a time when the American Group stood ready to enter into a preliminary contract. Even had they declined to take this initial step, the scheme would have been accepted in its entirety by the British Group and, by reason of the inter-group agreement, the American bankers would have had to participate in the deal.

The State Department's refusal to support J. G. White & Company as a participant in an international combination to build 10,000 miles of Chinese railways on the invitation of the Chinese Government, in May 1914, also killed this legitimate scheme. The State Department qualified the Chinese Government's plan as a monopoly in violation of the treaties, but four years later, it created a financial instrument to do the very thing it condemned when sponsored by the Chinese Government. Once again, in 1919, when the Consortium was organized in Paris, the Chinese Technical Delegation to the Peace Conference drew up a memorandum embodying the desires of the Chinese Government for the Consortium to consider. Again, the State Department called the Chinese plan a monopoly. The facts surrounding these endeavors of the Chinese Government to solve its problems on its own initiative and without outside interference, are known to only a limited number of people intimately concerned with the projects. Little or no publicity has been given to these facts, but they stand nevertheless as a crushing indictment of an Administration's misuse of its powers to interfere in international financial affairs.

The present Administration may have committed some errors of judgment in passing on the many foreign issues which have come under its scrutiny since 1922, but whatever its shortcomings, it has not been guilty of such wobbling and hopeless inefficiency as characterized its predecessor's handling of the Chinese situation. Senator Glass may succeed in creating a situation embarrassing to the Republican Party, but if he gets away with it, it is their own fault.

America's Foreign Investments

Getting a Dose of our own Medicine

THAT a more rigid supervision over foreign loan issues should be exercised by some machinery of government is clearly indicated by a classification of the facts relating to our foreign loans as they stand to-day. These facts are supplied by a book entitled "American Foreign Investments"* by Robert Dunn, who states that at the present rate of increase many economists expect our foreign investments to expand rapidly and steadily until 1935 will see us with $25,000,000,000 of our private capital abroad with the possibility of its reaching fifty billion by 1950. Although Europe will again become an active market for foreign development loans, America's lead is so great that it seems unlikely that it will ever be lost, unless we become entangled in another foreign war.

It is significant that the possibilities of such a war are already being discussed seriously on both sides of the Atlantic. Commander J. M. Kenworthy, member of the House of Commons, has written a new book, entitled "Peace or War ?" with an introduction by H. G. Wells, in which he describes "the present naval rivalry, with its background of competition in oil, rubber, cotton and other raw materials ; the states of mind in England and America favorable to war propaganda and the resentment of Europe to the supposed superiority complex of America, hate for her demanding repayment of the debts and jealousy of her wealth and material prosperity. If events move in the next ten years as they have moved in the last nine years, England will stand at the head of a European federation, of mutual distrust and disappointment with America."

If this is the sentiment that now prevails when we have just started on our career as world banker, it is not difficult to look ahead to the time when our foreign investments will have doubled and resentment against our wealth flares out into open hostility. We hear little talk of war in the United States. Americans are too occupied with their prosperity and searching out new fields for the investment of their surplus capital and markets for their manufactured products. The talk, such as it is, comes from Europe and, it is again significant that such a well informed man as Wickham Steed, former editor of *The Times*, is now in the United States on a mission of peace. Steed speaks for and reflects the minds of the best intellects in Great Britain and is perhaps the best qualified man to guage public opinion in Europe. His visit to the United States on such a mission is pregnant with meaning.

Coming back to our foreign investments, Mr. Dunn records how they are distributed country for country and how the change in our financial position was brought about. Although the data in regard to the Far East requires revision, it is a most timely and valuable contribution to a subject that is rapidly overshadowing all other international problems.

To read this book is a liberal education for Americans, for, as we in the past, have judged or misjudged the policies of other nations by their foreign loan transactions, so in turn, we are now being subjected to a merciless criticism of our own imperialistic financial tendencies. In the same manner that we jumped to conclusions and accused other governments with sinister and aggressive designs concealed behind the provisions of their foreign loan agreements, so we are now being arraigned and condemned before the court of world opinion for exacting terms and conditions which, on analysis, are as subversive of the administrative independence of the borrower as any of the European loans we formerly denounced.

The conviction that we intend to extend our financial imperialism to Europe and maintain that continent in a state of financial servitude for a period of two generations has become so firmly rooted in the minds of the peoples of that continent that no matter what we may now do to modify our present attitude towards the war debts, they will hold us responsible for all their financial troubles. So far has this unreasoning propaganda been carried, that before we are through with it, we will be held responsible for the causes that led to the war and claims brought against us for our delay in coming in. We are already adjudged guilty of the intent to maintain Europe in poverty and misery for the next sixty years in order to collect debts which although now recognized as legal obligations may in the course of years be repudiated as an intolerable burden upon those nations who fought our war for us. European politics for the next decade will be dominated by the issue of the war debts and we will always face the possibility that some day our Government will become fed-up with the controversy and wipe the slate clean by accepting some cleverly devised scheme that will throw the burden of the Great War upon the American tax-payer. The fat will then be in the fire.

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* Issued by the Viking Press, New York City.

No matter how honorable or disinterested our intentions or how legitimate our investments, we cannot escape criticism. Not alone in Europe but in every country in South America, American capital is now denounced as "imperialistic." In the Caribbean and Central American countries, Soviet propaganda has been successful in stirring up the people against us, even though in every case, the investment of American capital is all that has brought a small measure of prosperity and well-being to the natives and furnished the governments with the bulk of their revenues. We have escaped the charge of imperialism in China simply because our investments in that country are insignificant in comparison with those of Great Britain and Japan.

No one can read the story of American Foreign Investments with its full appendices of documents and Bankers Loan Agreements without realizing how unjust we have been in condemning the foreign investments of other nations. At the very time when American writers were bitterly denouncing the Japanese Loans to China and citing their predatory character as one of the principal arguments to justify the creation of the new Consortium and as a reason why we should fight Japan, we had embarked on a financial program in the Caribbean, which for all practical purposes undermined the administrative independence of four Latin American republics and created for our capital a preferred and almost monopolistic position. The bankers loan agreements reprinted in full in "American Foreign Investments" tell the story of how, with the support of the State Department, and in some cases upon its initiative, our bankers have dictated terms which no European or Japanese Government have attempted to impose upon China. The Nicaragua group of contracts, which fortunately were not ratified by the Senate, stands as a historical case, interesting for the thoroughness of the accompanying intervention which they provided.

Americans are learning that sentiment and business does not always go hand in hand. We are exacting enough now in imposing terms deemed essential for the protection of the bond-holder, but as a few more of our foreign loans are unpaid or repudiated, we will become as hard-boiled as any of the nations whose methods we have so bitterly assailed. When we find that our loans are being used to deprive us more and more of our export markets, and the struggle to maintain our trade position becomes intensified through European competition and the urge of our expanding mechanical civilization demands increasing orders to keep our factories running at a profit, then, and only then, will we awake to a full realization of the part that our foreign financing must play in creating orders for our materials. When we reach that point in our commercial development we will begin to realize that all this talk about imperialism and political aggression cloaked under the terms of commercial loan agreements is pure, unadulterated bunk. The real aim is to create business for the nation lending the money.

The assumption of superiority on our part in condemning the financial activities of other nations who have imposed supervision over expenditures and control of revenues as guarantees for their loans in backward countries, is like the pot calling the kettle black. Our superiority complex is resented and those we have slugged in the past are now hitting back, hurting us where it hurts the most. We are receiving a dose of our own medicine and it will require all the statesmanship and diplomacy of President Coolidge to dispel the suspicion and hostility of our neighbors to the South, when he attends the Pan American Conference in Havana this coming January. In the past, it has been a favorite indoor pastime for Americans to throw bricks at other nations, especially in connection with their financial activities in China. The others have learned how to play the game and are now retaliating by returning the compliment in Latin America.

Baron Shiba

A Distinguished Japanese Scientist

AMERICA honors itself by honoring Baron C. Shiba, the distinguished Japanese scientist who comes to us to explain his new high-speed camera able to take 20,000 photographs per second. Officially, Baron Shiba is chief of the aeronautical research agencies of the Japanese Government, but as *The New York Herald-Tribune* aptly says: "Our distinguished guest is actually a whole national research council in himself, responsible more than any other one man for the astonishing strides which Japanese science has taken in the last decade." His visit to the United States reminds us that the Japan of to-day is no longer the Japan which critics delight in characterizing as superficial and imitative and that her civilization and progress in industry and science as due is much to her own initiative as to her absorption of Western ideas. The benefits of a stable government, universal education, and an outlet for the energies of her professional classes, has produced in Japan a group of scientific leaders who hold first rank in world science, men who are warmly greeted and accepted as equals by their colleagues in Europe and America. In emphasizing this, the *Herald-Tribune* adds: "No man ever contributed so much to knowledge of earthquakes as did the lamented Professor Omoro. The innermost secrets of the atom obey the voice of Dr. Nagaoka, fortunately still at work. To Baron Shiba himself are credited vital contributions to the science of fluid dynamics, applicable equally to ships and to aircraft. The two great Japanese scientists who have honored us by working in America, Dr. Takamine and Dr. Noguchi, are better known to us because they have been closer, but they are not unique."

Describing the exhibition of Baron Shiba's new high-speed camera before the students of the Daniel Guggenheim School of Aeronautics, the New York press says that it was the first American showing of pictures produced by a camera invented at the Imperial Aerodynamic Research Department of Japan, of which Baron Shiba is director. The camera takes as many as 20,000 exposures a second.

As a tool of research, which will permit a study of almost any organic or mechanical action without regard to the speed with which it may be accomplished, Baron Shiba's camera has focussed the attention of the leading research engineers of the city in every branch of science.

Baron Shiba made only a brief address before showing the pictures, saying that the invention would speak for itself. He told how the camera had been developed, then explained briefly how it was able to photograph air currents. This is done by the Schileren process, a method perfected in Germany, and is made possible by the fact that light rays are disturbed as they pass through heated air.

The university auditorium was then darkened and on the screen there appeared "slow motion" pictures of air currents moving about a racing airplane engine. The flow of the air, which the mathematical side of aerodynamics never has been able to plot, was seen moving in fixed currents. The air appeared as long wraith-like clouds, passing so slowly that their course easily could be studied with the naked eye. In reality the air pictured was moving at the rate of more than thirty-five feet a second.

The air streams about a moving windmill were next pictured, the actual flow of the air being as rapid as sixty-five feet a second, but appearing on the screen to be moving very slowly.

The last section of Baron Shiba's scientific film showed a slow motion picture of a pistol bullet breaking an electric light bulb. This picture was photographed at the rate of 20,000 exposures a second. The result on the screen was a bullet loafing along on its way to the bulb, the first moment of contact when the bullet could be seen denting the glass and then plowing on through it while the fragments of glass floated in the air like debris from an explosion.

The main object of this camera is to improve aviation by studying the way wind hits the propellers and wings of an aeroplane which will show in a movie the formation of air pockets and air vortexes. Great improvement in efficiency, speed and perhaps safety of air navigation is expected to result from this high speed photography which has revolutionized the study of aerodynamics.

Japan's Real Policy in Manchuria

A Brilliant Survey By An Expert : Construction in Manchuria, While Chaos Elsewhere in China, Japan Bringing Outstanding Issues to A Head

*By Henry W. Kinney**

THE highly exaggerated statements which appeared in the Japanese press some time ago with regard to the elements which it was alleged were to constitute the so-called "positive policy" of the Tanaka Cabinet with respect to Manchuria, have been the cause of a reaction abroad, especially in the United States which is extremely interesting, but also to a great extent unfortunate. It may be remembered that at the time the local press was prolific with announcements disclosing what purported to be phases of this new policy. It was alleged that the South Manchuria Railway Company was to be made the leading instrument for Japanese exploitation of Manchuria ; its President was to be made a Consul-General and in this additional capacity he was to direct Japan's policy, etc., etc. It has since then been disclosed that there was remarkably little that was new or startling about the Manchurian policy of the present Government. Briefly, it seems to amount largely to a determination to bring to a head the settlement of various questions which have arisen between the Japanese and the Manchurian authorities for some years past. In other words, while formerly the very conservative attitude of the Japanese Government had allowed such questions to be constantly postponed, suffering the Chinese to their hearts' content the art of procrastination at which they are such adepts, the Tanaka Government apparently intends as far as possible to have these various outstanding questions, many of which have become quite moss-grown, brought to a solution one way or the other. In other words, it wants the Chinese to "fish or cut bait," which under the circumstances seems a very laudable intention to which no one should make any objection.

Unfortunately, the highly exaggerated reports with respect to Japan's intentions were allowed to remain uncontradicted by official authority for quite a considerable length of time, with the inevitable result that foreign correspondents employed the information thus given by the Japanese press, as a basis for their despatches to their papers abroad, which was, of course, a natural and obvious thing for them to do under the circumstances, as the material was certainly interesting and, in fact, even quite sensational. The results have now come home to roost in the form of a great number of editorials contained in numerous newspapers abroad. Copies of these editorials have been reaching Japan for some weeks past, and a perusal of them is, as has been stated, highly instructive, but, in some cases, also disconcerting.

Constructive Japan

Practically all this editorial comment has one thing in common, namely the conclusion that Japan is about to embark on a policy which is strongly aggressive. It is encouraging to note that a number of journals, including those appearing in most of the more intellectual and well informed organs, are on the whole favorable towards a determined stand being taken by Japan, expressing realization of the fact that conditions in Manchuria stand in striking contrast to those prevailing in the other sections of China—that in Manchuria one may see construction, while in all other parts destruction only is in evidence—and that the presence of Japanese interests in Manchuria is mainly the factor which has produced this commendable state of affairs. Such editors feel that peace and order are above all other things desirable in China, and therefore, that when Japan declares that she intends to see to it that this region shall remain orderly and shall be developed, the world at large must be satisfied in so far that such actions will cause at least one part of the vast area of China to enjoy the peace and prosperity which are conspicuous by their absence in China as a whole.

On the other hand, not a few editors jump to the conclusion that Japan has embarked on a policy of aggression which will mean virtual annexation of Manchuria, and they conjure forth chimerical visions of an immense conflict which, they believe, is likely to result therefrom. Manchuria is designated by such writers as a "danger spot," the "peril of the Far East," a region likely to witness shortly a conflict between Japan and Russia and even as the cause of a world war. Such highly fantastic flights of imagination are so intangible that they are hardly capable of contradiction—one cannot very well contradict a dream—but a few phases which recur constantly in this class of editorial opinion are sufficiently tangible to make it seem useful to discuss them, and, if possible, to bring some enlightenment to those who reason on the basis of palpable lack of information. We have reference here to the constantly reiterated assertion that Japan's negotiations with China on the matter of various Manchurian questions constitute intrinsically a reiteration of the famous "Twenty-one Demands," and the accompanying claim that Japan's new policy will amount virtually to the setting aside of the principle of the "Open Door."

Mr. Y. Matsuoka, Vice-President of the South Manchuria Railway

Twenty-one Demands and Open Door

Both the "Twenty-one Demands" and the question of the "Open Door" are favorite topics of writers on Far Eastern Affairs, especially of those who are inimical to Japan, but it is rather astounding that in spite of the fact that these subjects are so constantly being dragged forth in such discussions, very little knowledge—but a vast amount of misinformation — is shown by the writers who refer to them. There can be no good purpose served in trying to go back to a discussion of the original " Twenty-one Demands." For the purposes of the present discussion it may be admitted, for the sake of argument, that some of them were ill-advised. What concerns us now is the status and nature of the " Demands" as they stand to-day. In this connection one can do no better than to quote Dr. Payson J. Treat, the author of various works concerning Far Eastern affairs and known as an erudite and imperial historian. In the *Washington Historical Quarterly* (Vol. XVII, No. 2, April, 1926) in an article entitled " Our Asiatic Neighbors," Dr. Treat gives a clear and concise statement of the facts, saying that:

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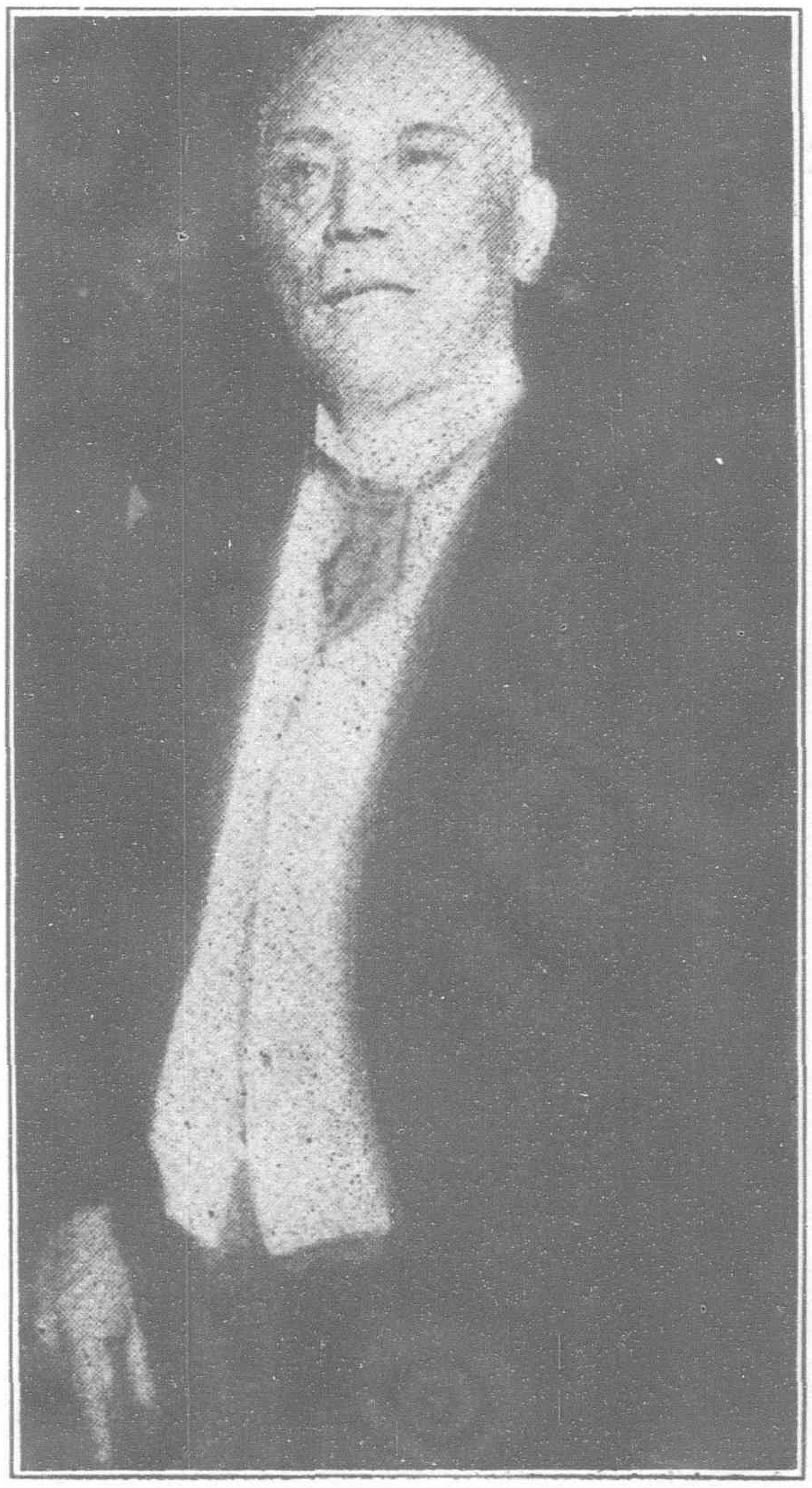
*Mr. Kinney is an expert on Far Eastern questions and is now associated with the South Manchuria Railway.

> " The American Department of State, after a careful scrutiny of the Japanese demands and in the light of information received from our representatives in Peking and Tokyo, informed Japan that in respect to sixteen of the demands it was not disposed to raise any question. These included the demands regarding Shantung Province, for which Japan was so roundly denounced in the United States four years later, and regarding South Manchuria and Eastern Inner Mongolia. Only five of the demands seemed objectionable to our State Department, two of these on the ground that they would be a violation of the principle of the ' Open Door' and three because they were ' clearly derogatory to the political independence and administrative entity of that country.' Japan acceded to our suggestions in every case. Four of the demands were dropped, and the fifth was changed to an exchange of notes which, following our suggestion, stated that China would not permit any Power ' to construct a dockyard, a coaling station for military use, or a naval base or to set up any other military establishment on the coast of Fukien Province, nor shall they allow any like establishment to be set up with any foreign capital on the said coast.' In other words, there was absolutely nothing in the Sino-Japanese treaties of 1915 to which the American Government has taken the slightest offense. Yet I am afraid it will be many years before American opinion recognizes these simple facts."



Mr. J. Yamamoto, New President of the South Manchuria Railway Company

It is thus made very plain that the United States finds nothing offensive in the Sino-Japanese Treaties of 1915 (which is the technical term for what is known as the "Twenty-one Demands"), so that even if any reiteration of such should have been made at this time in respect of Manchuria — which is not the case—it could hardly be so calamitous as certain sensational writers, unaware of or disregarding the above-mentioned facts, would have the world believe.

The second phase of the editorials referred to has to do with their claims that Japan is preparing to take action which will be highly disadvantageous to the United States, and to other commercial Powers, in that it will tend to close, or will effectually close, the " Open Door" in Manchuria. It may be well to preface discussion of this matter by quoting a paragraph from the work of Dr. Paul Hibbert Clyde. " International Rivalries in Manchuria," published last year by the Ohio State University Press (Columbus), which, by the way, is a volume which every student and writer on Manchurian affairs should read and keep for reference, as it is probably the most clear and comprehensive of recent treaties on this subject. In this book, Dr. Clyde says:

> By reason of loose interpretation and the use of general terminology, the " Open Door," in a popular sense at least, has come to mean anything and everything involved in the policy of the United States toward China. Regardless of what the explanation of this may be the fact remains that there is no justification for such a view. Secretary Hay's original " Open Door" notes indicated clearly and beyond any shadow of reasonable doubt what were the questions on which the Powers gave formal assurance, and it was the observance of these which the United States considered as constituting an effective " Open Door." Let it be noted further that far from creating a blanket agreement against special interests in China, the " Open Door" notes took cognizance of the existing so-called " spheres of influence of interest" and were intended as a guarantee against certain types of action in the "sphere" where it was claimed special privileges were to be enjoyed. Although these privileges were not very clearly defined they had to do largely with railway and mining rights. The " spheres of influence" continued to exist side by side with the " Open Door" doctrine, the only change being that the actions of the Powers within their respective " spheres" were limited by the three specific stipulations contained in Secretary Hay's notes of 1899.
>
> Lack of evidence on the basis of which Japan could be convicted of violation of the letter of the " Open Door" has led some writers to find cases of violation in spirit. From the legal standpoint the only act which could constitute a violation of the doctrine in spirit would be one which wilfully prevented the realization of the purpose sought through the three stipulations of the original Hay notes. There would seem to be no room for controversy on this point, as there is no doubt as to the actual meaning of the three stipulations, which again impresses one with the belief that had the doctrine been broader in scope than actually specified the existence of " spheres of influence" would have been entirely incompatible with it.

In view of the widespread misunderstandings as to the actual nature and extent of the " Open Door" it may be pertinent to refer to the following statement found in Mr. Tyler Dennett's " Americans in Eastern Asia" (pages 647 and 648), in answer to the question what had the United States obtained by the " Open Door " negotiations of 1899-1900:

> " Not so much as is popularly supposed. The United States had not secured more than already accrued to it under the ' most favored nation ' clauses in the treaties. The preferential railway and mining privileges had in no way been disturbed. Although the United States expressly stipulated that it did not recognize the spheres of influence the replies to the notes had in each case afforded an opportunity of reaffirming that there were such spheres . . . . as a matter of fact only the partition of the Empire had been halted. The Hay notes, which are believed to have been drafted by Rockhill, were as significant in their omissions as in their contents. . . These notes have been popularly mislabeled. They did not secure a completely open door. . . . . The United States was making no specific demand for the open door for investments

> . . . . . The United States merely demanded an open door for trade in that part of China in which American merchants were already interested. . . ."

As a matter of fact, however, the "Open Door" principle has been observed both in letter and in spirit by the Japanese in Manchuria. The impression which, unfortunately, is still fairly prevalent abroad, that Japan is making use of her position in Manchuria to create conditions which are especially favorable to the trade of her own nationals, and, conversily, harmful to the development of other nations there, dates back to the period almost two decades back when American merchants insisted that such was the case and had their views widely advertised in the foreign press. That, even at that remote time, these accusations were without foundation, may be seen from the following extract from the work of Dr. Clyde referred to above, which, exploring as its authority "United States Foreign Relations" (1906, pages 209-12) says:

> Reports openly accused the Japanese authorities with wilfully excluding American and British traders from Manchuria while their own nationals were permitted to gain a foothold, tending toward a monopoly, under the guise of serving the requirements of the retiring armies. With a view, therefore, of placing the exact situation prevailing in Manchuria before the American Minister, Mr. Rockhill, at Peking, and through him to the State Department in Washington, three American merchants representing the Shanghai American commercial interests visited Manchuria in June, 1906. These visitors were afforded every facility by the Japanese authorities for pursuing their investigation and on July 2nd their report was submitted to the American Minister. This document is of unusual interest not merely for what it contained, but because certain writers intent on proving a case against Japan have used phrases of the report, which, taken apart from the context, are entirely misleading.

The New S. M. R. Regime

That the charge should be made at this time that Japan's new policy with regard to Manchuria will involve closing or infringement of the "Open Door" there, is not only highly inaccurate, but even rather cruel in view of the fact that if this policy has any bearing whatever on the question, it is one which is specifically favorable towards the development of foreign interests in Manchuria. This should appear extremely plain from the appointment of Mr. J. Yamamoto, as President, and of Mr. Y. Matsuoka, as Vice-President, of the South Manchuria Railway Company. The latter during his former incumbency as a Director of the S.M.R., made a special effort to eradicate even the appearance of preference being given to Japanese traders by establishing a Foreign Section at Mukden for the specific purpose of furnishing a medium through which foreigners might be assisted and to which they might bring any complaints which they might have. These efforts have been widely recognized by the foreigners in Manchuria. Foreign merchants proclaim freely that not only does the South Manchuria Railway vastly facilitate business in Manchuria as it provides a safe, reliable, and efficient means of transportation, but that the presence of Japanese influence in Manchuria affords the only practical guarantee of the prevalence and continued existence of the peace and order in those regions without which foreign trade cannot operate. If any proof of this assertion be needed, such was afforded in ample measure at the time of the Kuo Sung-lin revolt, in the latter part of 1925, when the determined action of Japan in refusing to allow fighting within an area of six miles from the S.M.R. zone was the only thing which prevented chaos from disrupting commerce in Manchuria, and at that same time the foreign nationals in Mukden admitted freely that they must place their entire reliance for the protection of their lives and property on Japan, which was the only Power in a position to furnish such protection. In view of the tragic events which have since then transpired at Nanking and at numerous other points in China it is plain that Japan's policy in Manchuria has not only been useful but entirely essential for the development and prosperity of foreign commercial interests there. When to this it is added that foreign consuls stationed in Manchuria have stated freely that foreign business there enjoys the facilities provided by Japanese administration and instruments in the same degree as do the Japanese, and that complaints to the contrary which have from time to time been brought to them have, on investigation, invariably been found to be groundless, it should be plain to even the most prejudiced that when the foreigners who live and trade in Manchuria are appreciative of and pleased with the operations and attitude of the Japanese interests there, the world at large has no cause to be otherwise.

The New Loan

The charge that Japan is tending to operate against having foreign Powers participate in the development of Manchuria is not only groundless, but so contradictory to fact that it becomes absurd. Sufficient refutation should be found in the fact that the South Manchuria Railway Company has approached American bankers for the purpose of the floating of a large loan. This will give America —and also, for that matter, Great Britain to whom undoubtedly, if such a loan be arranged, a share of the loan will be offered by the bankers concerned—an opportunity to participate in the development of Manchuria. The facts of the case are simple enough. The vast immigration of Chinese fleeing from the war-torn areas of China to seek peace and an opportunity to gain a livelihood on the fertile, undeveloped plains of Manchuria, demands construction of railways without which the opening of such remote regions is impossible. China has neither the funds nor the credit needed for such construction, as a potential source of vastly increased outputs of raw materials and, with an increasing population, as a market for imported goods, is of great importance to the world at large as well as to Japan, Japan proposes to have other nations participate in this development by furnishing part of the funds needed, which investment, through Japanese media, finds justification in the fact that Japan alone can provide the protection which such investments must of necessity demand.

Japan has thus made the offer for foreigners to cooperate with her in the further opening and developing of Manchuria. In doing so, she realizes that she will herself benefit, partly through the fact that the development will thus be speeded up and partly because the presence of foreign interests in Manchuria will cause the foreign nations concerned to be as interested as is Japan in the maintenance of peace and order in the Three Eastern Provinces.

Even if the foreign nations should fail to take advantage of the opportunity thus offered, Japan stands ready to encourage the presence in Manchuria of foreign commerce and industry. This is in fact, the definitely pronounced policy of the South Manchuria Railway, made plain on several occasions by statements of its President, Mr. J. Yamamoto, who has laid special emphasis on the fact that foreign capital and commerce will, whether it operate in a big or in a small way, be encouraged to come to Manchuria and to avail itself of Japanese facilities in every way in the same manner and to the same extent as is done by the Japanese.

It would seem that, once these facts are known and the nature and extent of the Japanese policy are understood, the activity on the part of Japan in taking the initiative required for the development of one of the most important potential commercial and industrial fields in the world, will be appreciated and met with sympathy and cooperation instead of with ill-founded suspicion.

Bootlegging Aliens

More than 19,000 aliens were caught by immigration patrols during the past fiscal year attempting to gain illegal entry into the United States. Government officials estimate that only one in ten who sought to evade the immigration law were captured, so that at least 170,000 persons gained admittance illegally and by far the greatest number of those who have been detected in Cuba and Mexico waiting for the opportunity to transgress our laws, are Chinese. There is not money enough in the United States treasury to defray the expenses of rounding up and deporting the hundreds of thousands of Chinese residing illegally in the country. It is only another instance of how far the American people are hypnotized by the insiduous propaganda concerning the Chinese. What we stand from the recipients of our benevolence we would not tolerate one minute from the Japanese. Any attempt on the part of the Japanese to evade the exclusion clause in our immigration laws in such a wholesale manner as is now practiced by the Chinese, would result in a serious crisis in the relations between Japan and America. Yet the Chinese get away with it and no voice is raised in protest.

Keep the American Business Man in China

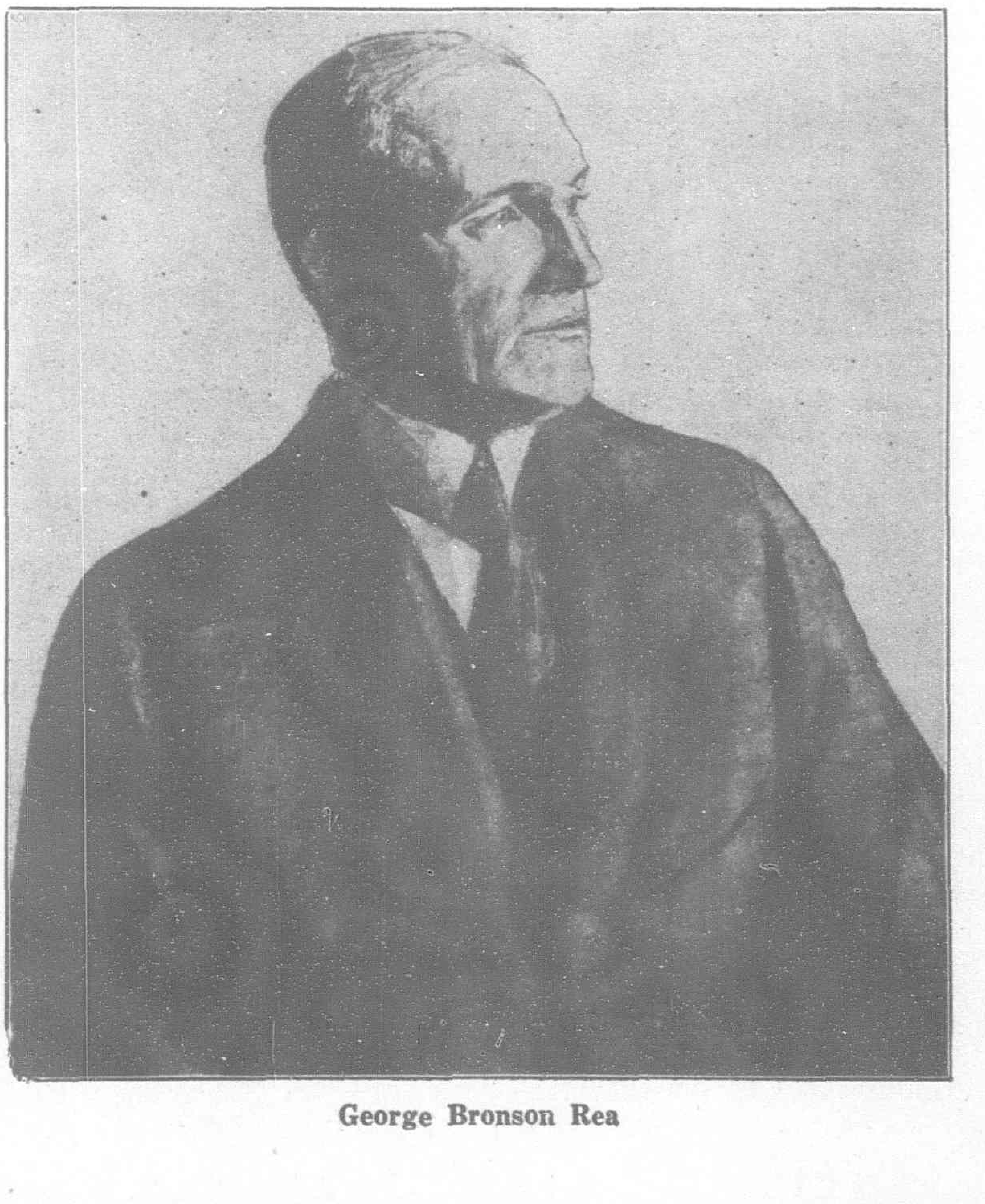
An Address before the Chamber of Commerce of the United States at its Annual Meeting at West Baden Springs, Ind., October 18, 1927

By Geo. Bronson Rea, National Counsellor of the American Chamber of Commerce of Shanghai, China

MR. PRESIDENT, I am going to talk only a few minutes. I want to bring to the attention of the convention a very vital matter affecting our trade interests in the Far East. When I arrived here the other day, I knew very little about the work of this great organization. My attendance has been a liberal education. I came here as the National Counsellor of the American Chamber of Commerce of Shanghai for the purpose of requesting your support to its resolution asking our Government for adequate protection to American lives and properties during the present disturbed conditions in that country and, to ensure as far as possible, the maintenance of American treaty rights pending their modification in a revision of the treaties with some recognized, representative government capable of discharging its obligations and assuring to foreigners some measure of justice and security.

I am leaving the convention firmly convinced that when the necessity for such protection arises, the Chamber of Commerce of the United States, speaking for the business interests of the country, will stand firmly behind their representatives in China and strengthen the hands of the President in any further measures he may take in upholding our treaty rights in that country. I say this, not because I have any definite assurance from the chamber on this particular subject, but because I feel that the course of events will sooner or later compel attention to the problem and influence the chamber to take action, and when that times arrives, the policies of the chamber as already laid down in regard to the protection of our foreign investments, and its outspoken condemnation of any recognition of or commercial intercourse with the Soviet, will exert a most powerful and helpful influence on the policy of the Administration in dealing with the situation.

I want to say a few words about China. I will not tire you with an explanation of the causes which have led up to the present deplorable situation in that country. All I want to emphasize and bring home to you is this. The real issue in that country has been deliberately camouflaged in order to gain the sympathy of the American people for the Kuomintang faction. For many years the struggle in China was simply one for power between rival war-lords in which there was no menace to foreign rights or properties. But, when the Cantonese and the Christian General Feng Yu-hsiang, let in the Soviet and accepted its money, its arms, munitions, advisers and military instructors and handed over control to the Red element, the internal struggle took on a new phase which deeply and intimately concerns every other nation enjoying treaty relations with China.



George Bronson Rea

Instead of a struggle to implant Nationalist ideals throughout China, the Soviet has employed this worthy Chinese movement as the screen behind which it has carried forward its warfare against the capitalist nations. This menace brought the Americans, British, Japanese, French, Spaniards, Portuguese and Italians together as one man to defend their lives and properties and to urge upon their governments the necessity of united armed intervention.

Now, it is not my purpose to advocate extreme measures, but it is only fair to invite your attention to the reasons which fully justify such intervention if the occasion again demands it. If we admit that Soviet Russia has the right to intervene in the internal affairs of China and use the Chinese armies as a screen behind which to carry forward its warfare against the interests of other powers, then the powers whose interests are menaced have the same right to intervene in the internal affairs of China for the protection of their interests. We cannot apply one principle where Russia is concerned and deny the application of that principle to other nations whose interests are placed in jeopardy. Gentlemen, that is fundamental. Remember that as long as any one faction in China is receiving arms, munitions and money from Moscow, sooner or later that faction will succeed in establishing its authority over the whole country, and we will face a new menace, a Red China. This means, if it means anything at all, a repetition of what has gone before in Russia, of what we are witnessing to a lesser degree in Mexico. It means debt repudiation, confiscation of foreign properties, cancellation of the treaties, abolition of all rights now enjoyed by foreigners under those treaties and, the inauguration of a reign of terror before which the deeds of the *Cheka* will pale into insignificance.

I could consume the entire time of this convention detailing to you the facts of this situation, and the only reason why I touch on it at all, is this. There is every indication that when Congress meets another campaign will be started to influence the Administration to enter into immediate negotiations with some faction for a revision of the treaties and the surrender of our rights. The Chinese tactics will be centered on separating us from the other powers by inducing us to enter into independent negotiations. The American commercial community in China and the American Minister to that country are already under fire by Chinese and Soviet sympathizers for their uncompromising stand last April in demanding adequate protection for their lives and properties and urging united action against the Sovietized Nationalist armies. The question of China and American rights in China will come forcibly before the American public this winter. Now, whatever has been done to date to adequately protect American lives and properties in that country has been done by the administration on its own initiative. While tremendous pressure was being exerted upon the President and the Secretary of

State to withdraw our war-ships and troops, evacuate all Americans and surrender immediately to the Nationalist demands, only two American concerns operating in China approached the State Department with a request for protection.

Now these American business men in China whose lives and properties are menaced, are your men, your representatives, struggling to defend and preserve the interests confided to their care. They are out on the firing line of world commerce in the most competitive market in the world, fighting your battles for commercial expansion. You cannot dissociate your interests from theirs. They are part of you. You cannot exist without them. Our trade representatives in foreign countries are an important part of the commercial system. The head, the heart, the brains, the vision, may be located here at home, but the feet that are carrying you forward to ultimate victory and continued prosperity are your foreign trade representatives. Of course, you can have your feet amputated and still live, grow fat and eke out a comfortable existence here at home. But that is as far as you will get in the struggle.

Can you afford to have your feet cut off without a protest or putting up a fight? Can you afford to have your representatives get out of China under pressure and surrender that market to your commercial rivals? If our firms are ever forced to get out of China or close up shop, you can depend upon it, that it will be a long time before they return. In the meantime, American business in the Orient will be handed over to our competitors.

It is absolutely imperative for the future growth and prosperity of this country, that American business men remain in China to conduct our business for us. Why? Because it is the greatest potential market in the world. You will have to turn more and more to the Far East to get rid of your products and to invest your capital. We are forced to go to China in order to sell our products there, simply because the Chinese will not come to us. Up to the present time, the Chinese have developed only one responsible import and export firm which has opened offices in the country to deal direct with our manufacturers. They lack this machinery for foreign trade, and until they have set up this machinery, the American manufacturer and producer must maintain his own channels of doing business with China, or, hand their representations over to the British or the Japanese, who between them, already sell probably fifty per cent. of our exports to China.

That is a rather remarkable statement. I listened to the Japanese Consul General in New York about a month ago making a statement on this subject, and he asserted that about 40 per cent. of American exports to China are purchased in this country by Japanese firms in New York for Japanese enterprises in China, so that practically one-half of our exports to China to-day is in the hands of the Japanese, destined for their railways, mines, sugar factories, and other industrial establishments in China. If we have to get out, practically the only people who will be able to do business on the ground will be the Japanese.

The Chinese are practically unanimous in demanding the immediate revision of the so-called unequal treaties and there is an influential element in this country favorably disposed to their demands. Sooner or later, we must face this issue. Now the policy of the American Government towards China is embraced in what is known as the Open Door Doctrine, which, briefly stated, is an international agreement to respect the principle of equal opportunity for the trade of all nations with that country and incidentally to guarantee its territorial integrity at a time when it looked as though China would be partitioned amongst the powers.

We talk about a revision of the treaties, but very few people know what it means. A revision of the existing treaties recognizing the full sovereignty of the Chinese Government in all matters, especially those concerned with its contractual independence to enter into development contracts, will automatically kill the Open Door Doctrine. Our trade and status in that country will then be defined and governed by the most favored nation treatment. China will then be able to exercise her full sovereign rights over contracts, loans, concessions and other development enterprises upon which to such a large extent Americans must depend in the future for the expansion of their trade with that country. China can borrow from whoever will lend and set aside as security whatever may be most acceptable to the lender, without any interference on the part of our Government or any other Government which may think the terms conflict with the principle of equal opportunity.

Treaty revision means the disappearance of the Open Door Doctrine and our right to intervene further in China's affairs. We must then either surrender our leadership to those nations which have the greatest commercial stake in that country, or, devise and put into force some other policy that will retain for the United States its preferred position.

I might add here that the British stake in China is $1,750,000,000, the Japanese stake $1,300,000,000, actual money invested. The American stake is $160,000,000, half of which represents missionary investments. So our stake is really a very small one, and when it comes to a revision of the existing treaties, our position will be a very weak one compared with those nations whose investments are ten times greater.

A new American policy towards China must be based on a friendly or benevolent intervention, either alone or in conjunction with the other interested powers. This intervention must be exerted to save China from coming completely under the Red influence of Moscow. We can take our choice; sit still and permit the Soviet to establish itself firmly in China and drive out our traders and close that great market to foreign commerce and delay for another generation the development of its resources, or, we can intervene in some friendly manner that will unite the opposing factions in some form of compromise government, bring peace to the people and open up the country to our capital and our manufactured products to an extent that it will ensure to us an enhanced prosperity for another quarter century.

For, deep down at the bottom, the Chinese problem is an economic one, a desperate struggle for mere existence on the part of the masses, due in large part to arrested development arising from the lack of capital to create much needed public works. No compromise, no lasting peace, can be established in China until some means are found to provide immediate employment for hundreds of thousands of men who now eke out a precarious existence through the possession of a rifle. You can never disband these armies, until work is in sight for the disarmed soldiery. Russia recognizes the situation and provides the rifles and munitions which are being used to prevent China from becoming a market for foreign manufacturing nations, and contributing to their prosperity.

It is impossible for me with the length of time at my disposal to go deeper into these questions. The problem of China and our policy towards that country is bound to come to the fore in the near future. Whether this government will be called upon to defend American lives and properties and ensure as far as possible the carrying out of the existing treaties pending their revision, or, whether the problem turns upon the creation and application of a new American policy towards that country, Americans in China look to this chamber for such aid and support as will strengthen their position and guide the Administration and Congress in formulating a new program.

From what I have learned here in the last few days, of the aims and aspirations of this organization, I am satisfied that in this Chamber, the American commercial community in China has its most powerful and effective champion, and when these questions arise, as they will arise during the winter, we look confidently to you to help us out.

Slavery in China

It comes as a shock to learn on the authority of the League of Nations that slavery still prevails in nineteen countries and that the slaves still to be emancipated in 1927 are more numerous than the negroes emancipated by the proclamation of President Lincoln. The chief slave-holding countries are China and Abyssinia. China's slaves are estimated at about one in 150 of the total population, or approximately 3,000,000. Slavery is so unpleasant a word for a nation seeking to establish its equality with other Powers, that the Cantonese Government has thought it well to apply the term "adopted children" to women captured or sold into bondage. If we ignore the camouflage however, we can hardly doubt the statement that China's chronic dissensions and the resultant confusion of authority have been favorable to the traffic not only in opium but in human beings. The League of Nations report says that the very fact that the municipal authorities of a city like Fatshan have issued an order prohibiting the direct sale and purchase of slaves is significant.

“Jim” Farrell

The Man Who Laid the Foundation for American Engineering Supremacy in the Orient

By George Bronson Rea

EUROPE has sent many delegations and commissions to the United States to discover the secret of our prosperity. *The Daily Mail* Trade Union Mission, composed in its entirety of workmen, was given the opportunity to understand aright this secret when its members sat down to a farewell dinner and round-table conference in New York with thirty odd captains of American industry, every man of whom had started life in overalls or in an office position at the bottom of the ladder. There are other reasons for American prosperity, but in the last analysis, it is the spirit of real democracy which opens the door of equal opportunity to the highest positions in the land to the man of ability, that gives us the edge on our competitors.

James A. Farrell

Once more the real secret of America's commercial success is laid bare to the world by the announcement that James A. Farrell is to succeed Judge Gary as head of the United States Steel Corporation, the greatest industrial organization in the world. Once more the leaders of American finance have demonstrated their sound common sense by selecting the best equipped man to direct the affairs of our basic industry. Inherited wealth, family names, social prestige or political pull, so essential to success in Europe, give way to true worth and merit in America.

Starting at the age of fifteen and a half, as day laborer in a New Haven wire mill, and then up through the stages of mechanic, foreman, salesman, salesmanager, general manager, foreign sales agent, president of the United States Steel Products Company to president of the parent corporation and now to Chairman of the Board, the highest position in the world of industry, the career of “Jim” Farrell stands as one of the greatest tributes to the principles upon with the American nation is founded. The nearest approach to this remarkable record is found, not in democratic Europe, but on the other side of the world, in Japan. The same qualifications which carried the American laborer to the highest position in our industrial life, elevated step by step the young graduate of Boston “Tech” to the head of the great Mitsui organization. Dr. Takuma Dan, the Director General of the Mitsui Gomei Kaisha and James A. Farrell, Chairman of the Board of the United States Steel Corporation, the leaders of industry in their respective fields, have risen from the bottom to the top through sheer merit and worth.

“Jim” Farrell was selected by J. P. Morgan, the elder, as president of the United States Steel Corporation because he was the one man who had the ability to sell the products of a corporation whose capital had been swollen to a billion dollars by numerous consolidations. When he took over the export end of the corporation he demanded that a certain percentage of the total steel output be set aside for his department to market abroad. Foreign sales of $31,000,000 in 1904 were increased to $200,000,000 by 1912, to $200,000,000 in the war year of 1916 and they still run over $150,000,000. The cost of doing this foreign business when Farrell took it over, ranged from 7 to 11 per cent. He quickly cut it down to less than one per cent. Sitting in his office in the Hudson Terminal Building in New York, Farrell knew exactly just where there was a demand for steel in every country of the world. He did not rely on the reports of his representatives and agents to keep him posted. Clipping services from all countries kept him fully and accurately informed on every new development calling for the use of steel, and when his company was not invited to submit bids, he wanted to know the reason why. Nothing escaped him.

One of the contracts which materially assisted in establishing this position was for the supply of rails and bridges for the South Manchuria Railway in 1906. Japan had raised a loan of £20,000,000 in London to rebuild and re-equip to standard specifications the broken-down broad gauge Russian line which came to her as the spoils of war. British manufacturers naturally expected the cream of the orders for materials, but time was the essential quality. Japan wanted delivery and wanted it quick, in order to bring order out of chaos in the war-torn territory. British manufacturers working overtime to fill orders at home and abroad, could not promise delivery within six or eight months. Farrell guaranteed immediate delivery and got the order. At that time all steamship lines to the Far East were under foreign control, and quoted a freight rate that would deprive the American company of any profit on the Japanese order. “All right,” said Farrell,” “we will operate our own steamship service” and forthwith chartered a number of steamships and opened a new service to the Far East under the name of the American-Manchurian Line, the forerunner of a steel fleet which now carries the products of the corporation to all corners of the world. The prompt action of Mr. Farrell permitted Japan to rebuild the South Manchurian Railway to American standards. The order for rails and bridges was supplemented by equally huge orders for American locomotives, cars and other accessories whose prompt delivery was also guaranteed by the Steel Corporation's new fleet of steamers. Europe's monopoly in railway building and equipment in Asia was broken and 600 miles of American railway equipped down to the last spike with American materials provided the Orientals with an object lesson in American railway practice. Japan did for us something we had never been able to do for ourselves in China, but the credit at this end goes to the man who refused to be counted out of the game when the European steamship lines tried to hold him up and take away the profits of the deal. Friendships then formed, continue to this day. Japanese look upon the United States Steel Corporation as their best friend in America, and when a deep laid conspiracy almost led to a war between the United States and Japan, it was Judge Gary, more than anyone else, who denounced the movement and advocated peace and better understanding. The place of honor in the homes of many of the leaders of present day Japan is given to Judge Gary's photograph. The offices of the Chairman of the Board and of the President of the Steel Corporation display on their walls the signed photographs of many of the most prominent Japanese statesmen and captains of industry. In China, as well as Japan, Gary and Farrell are names to conjure with.

The real beginnings of American engineering prosperity in the Far East were laid when Mr. Farrell took the order for the South Manchuria Railway equipment. The original order was followed by others. Mines, flour, oil, cotton, sugar and other industrial establishments followed the railway, and the bulk of the orders for equipment went to American manufacturers. Within fourteen years after Japan took over the South Manchurian Railway, American manufacturers sold nearly $100,000,000 worth of engineering and industrial materials to Japanese enterprises in Manchuria alone. To-day, forty per cent. of all American exports to China, nearly $50,000,000 a year, passes through Japanese firms located in the United States, destined in large part for Japanese industrial enterprises in China. Japan herself is our best customer in Asia, the third best customer we have, and much of our exports, exclusive of raw cotton, are iron, steel and engineering materials. On the foundation laid in 1906 in Manchuria by " Jim " Farrell, has been built an export trade that in time will give American manufacturers the supremacy in Far Eastern markets.

Mr. Farrell's interest in extending our foreign trade, led to his founding in 1914, the National Foreign Trade Council, which, under his leadership as chairman, is now the most influential commercial organization in the country. American merchants in the Far East owe a debt of gratitude to the man who succeeds Judge Gary in the direction of our most important national industry.

British Trade and Industry

By Gilbert C. Layton, Assistant Editor of "The Economist"

(SPECIAL TO THE " FAR EASTERN REVIEW ")

The Iron and Steel Trades

DURING the past few days a number of iron and steel companies have published reports which have served to call attention once more to the general position of the iron and steel trades. The chief interest, however, centres in the speech of Mr. A. O. Peech, chairman of the United Steel Companies, one of the largest steel producers in the country, at the annual meeting of the company. The governing factor in the iron and steel trades, he points out, is the disparity between the output capacity, artificially enlarged for war purposes, and the commercial demand, restricted owing to the limited purchasing power following the war. For the current year, Mr. Peech estimates, the industry will be employed to no more than 80 per cent of its total capacity. Despite the recent improvement in world conditions, " there are disturbing indications that our position is being seriously prejudiced."

Mr. Peech clearly has in mind the importation of foreign iron and steel. " The Continent has, in fact, obtained a footing in the supplying of the iron and steel needs of British industry which places them in the position of very formidable competitors." There can be no doubt that Mr. Peech regrets that the Government has not been able to bring the iron and steel trades within the scope of the Safeguarding of Industries Act. But to seek remedies in this direction is scarcely more helpful than crying for the moon. The facts of both the domestic and the international political situation entirely rule out the possibility of protection for these trades. Moreover, some authorities, taking the long view, attach less importance to the Continental imports than Mr. Peech. Rationalisation, these authorities hold, can do much to improve the fortunes of the industry. It would be more to the point if the leaders of the industry would consider action on these lines rather than bewail its present plight and hanker after remedies that are of no practical importance whatever.

The Coal Industry

The leaden sky that has so long overshadowed the coal industry shows no signs of breaking. The improvement that has occurred has been mainly of a seasonal character. Domestic demands are roughly normal, but the requirements for industrial purposes have not expanded to the extent hoped for. The export trade has been hampered by temporary shortages of tonnage and the recent fog at the ports, and though signs of an improvement are discernable in certain directions, the prospects as a whole are not favourable.

Meanwhile, the publication of important facts and figures relating to the Durham coalfield and the desire of the owners in this field to ease their burden in the matter of wages has once more focussed attention upon the deplorable financial position of the industry in general. Taking the Durham figures, for example, even in the abnormal period of the first quarter of the year, when demand and prices reflected the condition of a home market denuded of stocks, the result of the ascertainment of the working results was the meagre profit of 3.8d a ton. Net costs of production in this period averaged 14s 9.79d a ton and proceeds 15s 1.59d. In the interval the position has rapidly worsened, the loss since June having been over 1s per ton, the August figure being 1s 3.24d per ton. The proceeds for six months past have been continuously insufficient to meet all the costs of production, including wages. Nor is Durham suffering alone. All the exporting coalfields are acutely feeling the effects of a world supply of coal in excess of the demand. One must say of the coal industry very much the same as we have said of the iron and steel trades. The way to better times lies, as the Royal Commission on the industry pointed out, through rationalisation. The parties concerned have yet to realise this.

The Motor Industry

The annual British Motor Car Show has been held this month at Olympia and has been a greater success than any of its predecessors. The attendance of the general public constituted a " record " and manufacturers are, on the whole, well satisfied with the orders booked. Dealing first with one or two of the leading features of the show, the display of closed carriages, and especially those of the fabric type, attracted much attention. Built on to the big cars, it is a light, airy, roomy and attractive thing; allied with the small power chassis it adds to the appearance of these little models and gives them form and grace. Next year will undoubtedly see the closed car predominant on the roads and the fabric type the most popular. It is not yet so popular, however, that all makers have adopted it. Moreover, makers are once more making a special effort to cater for the motorist of modest purse.

A few facts regarding the importance of the British motor industry may not be out of place. There has been a sevenfold increase in the annual registrations since the war, the selling value of the output of the motor and allied trades having advanced from £18 millions in 1912 to £94 millions in 1924. The industry as a whole, however, is not on a sound financial basis. Referring to the latest balance-sheets of 17 representative companies, only two—and these were manufacturers of commercial vehicles,—were able to return an increase in profits as compared with the previous year; roughly half the companies were unable to pay a dividend to their ordinary shareholders. Some financial reconstruction has been undertaken recently, but more remains to be done. Supreme engineering skill is not necessarily accompanied by wise financial management.

Trans-Pacific Telegraph

By K. Higashi Kawa, General Manager Western Division Nippon Shimbun Rengosha

TELEGRAPH is a quick means of communication, but we can hardly call it modern because we have had it for the past 90 years, the first telegram having been exchanged between Euston Square and Camden Town in July, 1837. Even in Japan we have had it for the past 58 years, the first telegraph line having been opened in 1869 between Tokyo and Yokohama.

However, let us move quickly and see how the cables came into use. The first cable was laid in 1850 between Dover and Calais across the English channel. Brett brothers, who laid the cable sent the first message over this route to Louis Napoleon. But the cable was broken down before the recipient had time to send his reply. However, in the following year, a stronger cable was laid, and it was opened for the general public. The distance between Dover and Calais is only about 25 nautical miles, but it separated England from the continent. The laying of this submarine cable linked together the island empire with the countries of Europe. This link has since grown much stronger and there are 20 or more cables connecting England with the mainland.

Japan's first telegraphic connection with the outside world was made on June 26, 1871—21 years after the cable across the English channel was laid. This was Japan's first cable, and it was laid between Nagasaki and Shanghai, though it may not be right to call it "Japan's," because it was laid by the Great Northern Telegraph Company of Denmark. Later the same company laid another line from Nagasaki to Vladivostok. The two cables were doubled in 1882.

It was just 21 years ago, or to be more precise, on August 1, 1906, that a line to connect Japan with the continent of North America was opened up. This was done by laying a cable between Tokyo and the Bonin Islands, where the Japanese line was connected with the Commercial Pacific cable, which was extended from Guam for the purpose of the new connection. This cable runs across the Pacific ocean by way of Bonin, Guam, Midway, Honolulu, and finally landing at San Francisco.

There is another trans-Pacific cable, and that is the British line that runs from Vancouver to Fanning Island, Fiji and Norfolk Island in the Pacific, thence to New Zealand and Queensland respectively. It is also connected with Auckland and Sydney. This British Pacific cable was opened on October 31, 1902, 25 years ago.

Those two cables, one American and the other British, are the only trans-Pacific cables that are in existence to-day. It is quite evident that life around the Pacific ocean does not move as quickly as that around the Atlantic, for across the Atlantic ocean there are about 100,000 nautical miles of cables, as against 20,000 across the Pacific. One thing is certain, that the cable rate between San Francisco and Tokyo is much higher than the rate between New York and London. The Japanese press is endeavoring to bring down the Pacific cable rate, for we are convinced a lower cable rate tends to foster business, promote international friendship, and quickens life to some extent.

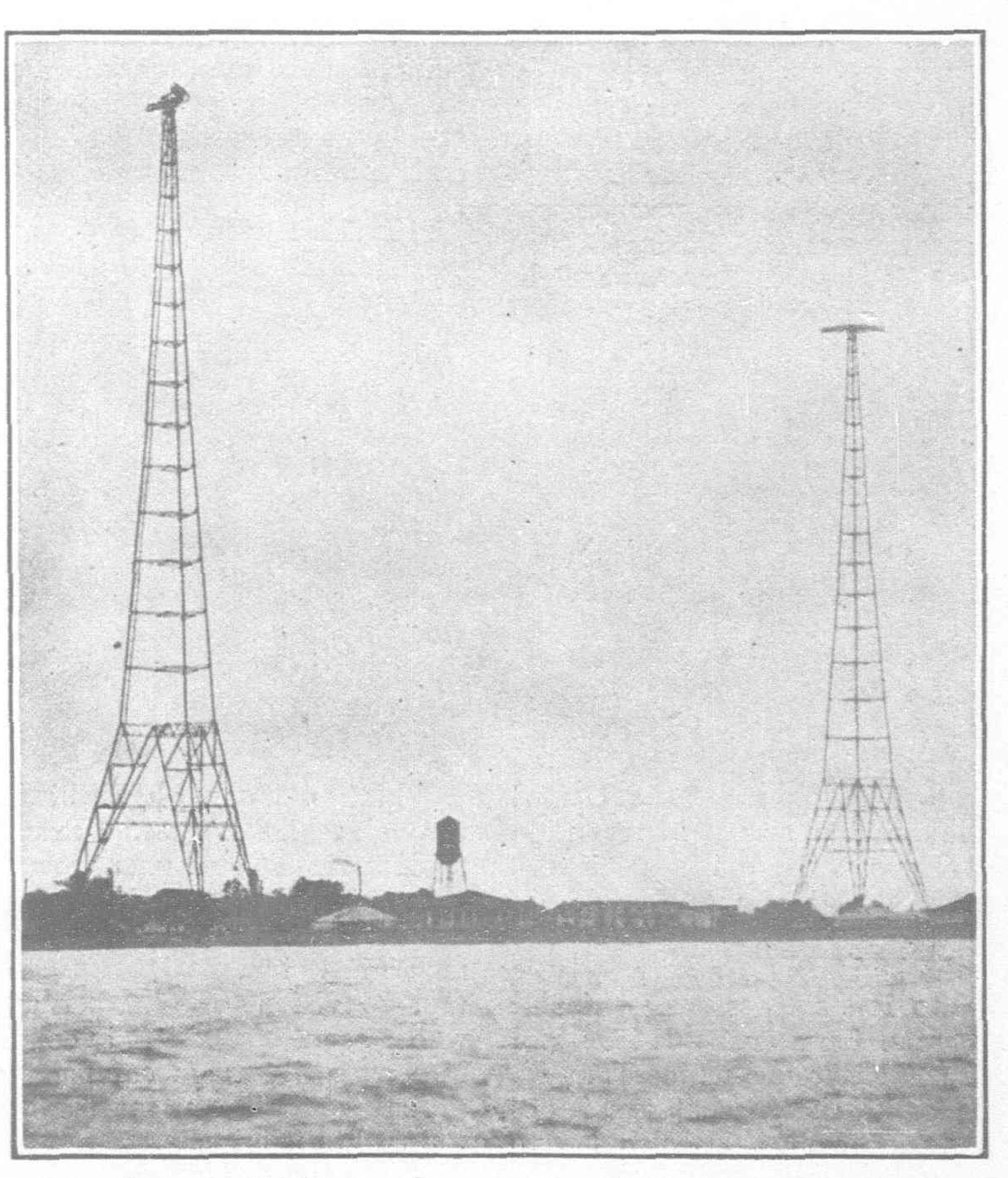
So much for the cables. We will now consider the radio—a more modern invention.

Those who have crossed the Pacific ocean know full well what a big pond it is. They must realize that it is a tremendous proposition to lay a cable from one side to the other. It is an expensive business too. I do not know how much the American cable cost, but the British Pacific cable was laid at the cost of over two million pounds, sterling. This was 25 years ago. In 1919, enterprising business men of Japan thought of laying an all-Japanese cable across the Pacific, but they soon discovered that they could not do it, because we had no material to make the necessary length of cable. In the meantime science made rapid progress, and wireless came more and more into actual use in trans-oceanic communications.

In the year 1915, the United States constructed two powerful wireless stations ; one at San Francisco, and the other at Honolulu. In the same year, the Japanese navy completed a new high-power station at Funahashi. The Japanese Department of Communications made an arrangement, by which public messages were handled at the Funahashi naval station. In this way, the trans-Pacific wireless communication was opened on December 16, 1916. All the messages were relayed at Honolulu.

But the ever growing volume of trans-Pacific messages made it imperative for the Japanese Department of Communications to establish an independent station. This was done in 1920 by constructing the Iwaki Wireless Stations, consisting of two stations, one a receiving station situated at Tomioka and the other a sending station located at Hara-no-Machi.

To understand the subsequent development, it is necessary for us to know something about the Nippon Musen Denshin Kabushiki Kaisha, the Radio Corporation of Japan. This company was formed in October, 1925; and took over the engineering side of Japan's external wireless communications, that is the construction of stations, the installation of machinery, their control and repairs. The Department of Communications, however, remained absolutely in charge of the operation and maintenance end. The Iwaki Wireless Stations, to which I referred before as having been constructed by the Department of Communications, are now the property of the Nippon Musen Denshin Kabushiki Kaisha. The Hara-no-Machi sending station is situated about 170 miles north of Tokyo. It has an extensive site facing the Pacific Ocean. The company has quite recently completed an up-to-date receiving station at Kawagoye, in the suburb of Tokyo. This new station is connected with the Tokyo Central Telegraph Office by means of a tone channel, which enables American wireless messages to come right into Tokyo, whereas formerly they had to be received at Tomioka, whence they were relayed over the land line at Tokyo.



From Cavite, in Manila bay, the powerful radio station sends messages to Washington and relays American messages to the mainland Orient. At a few cents a word the Manila press may receive all the American news it desires, using the naval radio.

This, together with the control line recently constructed from the Tokyo Central Telegraph Office to the Hara-no-Machi sending station, make the trans-Pacific wireless speedier and, perhaps to some extent, more accurate. You may be interested to know that last year a delegation from the Press waited upon the Minister of Communications, and urged him to open negotiations with foreign telegraph companies for the reduction of telegraph rates. We are glad to tell you that the American Radio Corporation readily accepted the proposition put forth by the Japanese Press, and the press rate was reduced. It is now 36 sen per word from San Francisco to Tokyo. A reasonable rate enables news agencies and newspapers to carry more news, which makes the public better informed.

I am now coming to the end. The telegraphic facilities across the Pacific Ocean have thus improved in the past 21 years, but Osaka is still without any direct means of communication with the external world. Telegrams to and from America have to pass through Tokyo. Messages to and from China must go through Nagasaki. No trans-oceanic wireless stations are to be found anywhere near Osaka, except a small receiving station at Hirano in the suburb of Osaka, which receives wireless messages from Europe, and it cannot send messages. Even this small station will shortly be transferred into an internal station, and the international traffic now handled will be transferred to the big station now under construction near Nagoya. Osaka is often called the Manchester of the Far East. The Royal Exchange at Manchester has a direct cable connection with the New York Cotton Exchange. The Sampin Exchange here has no direct means of sending its quotations even to Shanghai.

Fortunately, we now have a Governor here, Mr. Tahabe, who has served for many years in the Department of Communications, and is thoroughly familiar with matters connected with telegraphs. Furthermore, we have a Mayor, Dr. Seki, who is an authority on communications. We may, therefore, rest assured that the question of a direct telegraphic touch for Osaka with America, Australia, India, China and other countries around the Pacific Ocean will soon be taken up.

China and Nicaragua

Intervention Justified by Soviet Activities

IN various speeches and articles Mr. George Bronson Rea, Publisher of THE FAR EASTERN REVIEW has defended the American Chamber of Commerce of Shanghai in appealing to its government for armed intervention in China. Not that he fails to sympathize with the legitimate aspirations of the Nationalist cause, but because in his mind the evidence was overwhelming that the movement was used by the Soviet to further its warfare against the so-called capitalistic Powers, including the United States. We could not applaud a principle when applied for the advantage of Russia and denounce that principle when acted upon by other Powers whose interests were placed in jeopardy through its operation. Soviet advisers, propaganda experts and military leaders directed the movements of a Chinese army that was financed, armed and equipped by Moscow, an open and flagrant intervention in the internal affairs of China for the avowed purpose of driving the foreigner from the country and depriving him of his rights and properties. The menaced Powers had an equal right to intervene in China's affairs by supporting any faction that would oppose the Soviet program and, if Great Britain or Japan should decide to finance Chang Tso-lin, the American Government could interpose no serious objection, despite the clamor which might be raised in this country.

The American Government, in defense of American interests in Nicaragua, has been forced by similar reasons to take drastic action against the menace of the Soviet working through Mexico. The proofs of Mexico's intervention in Nicaragua are now made public through the enterprise of the Hearst newspapers. As the raid on the Soviet properties in Peking brought to light the evidence that incriminated Moscow in China, so the damning evidence is now revealed that President Calles of Mexico was using the secret service funds of his government to foment opposition to the United States in Nicaragua. At the very time when the press of the United States was thundering against the iniquity of armed intervention in China, the American Government was actively intervening in Nicaragua for the identical reasons which justified united action in China. Six documents published by the Hearst newspapers consist of letters signed by Calles ordering the Mexican Treasurer to issue various amounts ranging from 10,000 to 100,000 peso to particular individuals including Nicaraguan agents, for secret missions and arms and ammunition for the use of the Nicaraguan Liberal army. These documents, fully substantiating the charge that the Calles Government was supporting the Sacasa revolution which led to American armed intervention in Nicaragua, were obtained from the secret files of the Mexican Government by men in the employ of that government opposed to the Bolshevist tendency of Calles.

These documents fully supports the message to Congress of President Coolidge on January 10, when he openly accused Mexico of aiding the rebels and stating that he had proof of this aid. Two days later, Secretary of State Kellog gave evidence before the Senate Foreign Relations Committee that the State Department was in possession of the proof that the Soviet was behind the revolution in Nicaragua, declaring that Moscow was seeking to organize Latin America against the United States and that this plot was being carried out through the intervention of the Mexican Government. He submitted the proofs that Mexican Government arms had been shipped to Sacasa and that some of the arms used by the Nicaraguan rebels were part of a consignment of American army rifles sold by the American Government to Obregon to enable him to put down the de la Huerta revolution of several years ago.

In his message of January 10, President Coolidge said:

> “ The United States cannot fail to view with deep concern any serious threat to the stability and constitutional Government in Nicaragua tending towards anarchy and jeopardizing American interests, especially if such a state of affairs is contributed to or brought about by outside influence or by any power” As a matter of fact, I have the most conclusive evidence that arms and munitions in large quantities have been on several occasions since August, 1926, shipped to the revolutionists in Nicaragua. Boats carrying these munitions have been fitted out in Mexican ports, and some of the munitions bear evidence of having belonged to the Mexican Government.” It also appears that the ships were fitted out with the full knowledge and in some cases with the encouragement of Mexican officials and were in one instance commanded by a Mexican naval reserve officer.”

If the evidence establishing Soviet intervention in Latin America through a highly-placed Mexican dupe is strong enough to influence the American Government to adopt drastic measures repugnant to its conception of fair-play in Nicaragua, how much more justified are the other Powers in taking similar action to protect their huge investments in China, menaced not so much by the Chinese demands for treaty revision as by the pernicious activities of a communistic state whose agents succeeded in converting a laudable Chinese movement into an anti-foreign campaign? The American Government will probably never consent to the use of its armed forces to coerce China, but it has created the precedent that fully justifies any other Power in defending and protecting its interests against a movement inspired and supported by Moscow for the futherance of the Soviet dreams of World Revolution.

Attorney-General's Ruling on Tariff Commission's Right to Conduct Investigations Into Foreign Manufacturing Costs

THE French Government has gone on record that it does not wish to have American tariff and treasury agents invading its factories and prying out trade secrets in order to determine costs of production for the purpose of fixing the American tariff under the flexible provisions of the Fordney-McCumber Tariff Act. The practice authorized by this law of sending tariff commissions to foreign countries in order to supplement the labors of duly accredited commercial attachés, trade commissioners and consular officials in collecting trade data, is bound some day to involve the United States in an acrimonious dispute with the government of some commercial rival which objects to this official probing into its trade secrets. Under the provisions of the Fordney-McCumber Tariff Act, wherever practicable or feasible, it is deemed incumbent upon the United States Tariff Commission to make these investigations to determine the costs of production, but wherever possible, it has been the practice of the commission to determine these costs by working back from the invoices accompanying foreign merchandise imported into the country, thus eliminating any cause for complaint or friction.

In view of the international importance of this question, a recent decision of the Attorney-General of the United States is of interest as he indicates that the Tariff Commission is justified in sending agents abroad for collecting costs-of-production data wherever feasible. This decision was presented to the President in response to questions arising out of the Commission's investigations of the tariff on rag rugs raised by the Chief of the Foreign Tariffs Division of the Commerce Department, with special reference to the manufacturing costs in Japan.

At the outset of the investigation the commission determined that Japanese costs were to be inferentially determined, without foreign field work, from invoice prices and that is the method which was followed. The Attorney-General explained that it was suggested in the commission's report that the accounting records of some Japanese producers were open to the commission and, in any event, that a field investigation in Japan of wages, cost of materials and other items entering into the cost of production of rag rugs was possible.

The act specifies what the President shall take into consideration, so far as he finds it practicable, and requires the commission to make an investigation to assist him, and that no proclamation shall be issued until that investigation has been made. The necessary inference is, declared Attorney-General Sargent, that the commission is required to investigate and report on all those matters which the President is required to consider, and that a report of the commission which does not deal with all the matters which the President is required to consider does not satisfy the statute.

The President is required to take into consideration, wages, costs of materials and other items in the cost of production in the United States and in competing countries so far as he finds it practicable, and unless it is impracticable to consider such matters the Tariff Commission is required to investigate and report upon them.

While the decision as to whether matters specified in the statute may be omitted from consideration because it is impracticable to consider them rests finally with the President, the Attorney-General added, the Commission must, in the first instance, exercise and express its judgment on that subject, with a view to assisting the President; and, he added, if the commission, because it deems it impracticable, refrains from investigating and reporting upon any of the matters mentioned in subsection (c), its report should disclose that the commission considers the inquiry impracticable and the reasons for its conclusion, in order to enable the President to determine for himself whether it is impracticable to consider the matters in question.

"I am of the opinion that a report of the commission, which discloses that no detailed investigation has been made into wages, costs of materials, and other items entering into the cost of production in competing foreign countries, and which determined costs of production abroad only by inference from the invoice prices of imported articles, fails to satisfy the requirements of the statute, unless it appears that the detailed investigation is impracticable," ruled the Attorney General.

"The word 'practicable' means possible or 'feasible,' and no doubt the provision in this statute that the conditions in production in competing foreign countries should be considered by the President 'in so far as he finds it practicable' was put there primarily to cover situations where, through obstructive methods by foreign producers or in foreign countries the commission finds it difficult, if not impossible, to obtain the necessary information; but the word 'practicable' also means 'capable of being used,' or 'usable,' and I am of the opinion that under the provisions of this statute the President may refrain from taking into consideration wages, costs of materials, and other items of production in competing foreign countries usually ascertainable by direct inquiry or field work where he finds that such an inquiry is impracticable in the sense of being futile.

"In the present case, the report of the commission and the material which it contains suggests the futility under the particular circumstances of this case of a direct inquiry abroad as to the matters mentioned in paragraph (1) of subsection (c) of section 315. The commission appears to be satisfied that whatever the exact cost of production in Japan may be, it is not more than the invoice price of the rugs imported into the United States from Japan.

"The report also discloses that, on the assumption that the cost of production in Japan does not exceed the selling price of Japanese manufacturers in the United States, the difference in cost of production at home and abroad is so great that by making the maximum increases permitted by law the President's action would fall short of equalizing the difference. It is obvious that a field inquiry in Japan, developing more accurate information as to cost of production there, would not affect the result in this particular case unless it disclosed that the cost of production in Japan is higher than the invoice prices of Japanese imported rugs. In other words, a field inquiry abroad as to wages, costs of materials and other items of cost of foreign production would be impracticable, in the sense of being useless, unless foreign costs, are higher than the invoice prices of imported rugs. There is nothing in the report suggesting that Japanese manufacturers are selling rugs in the United States at less than it costs to manufacture them or that the invoices do not correctly disclose the selling price of imported rugs.

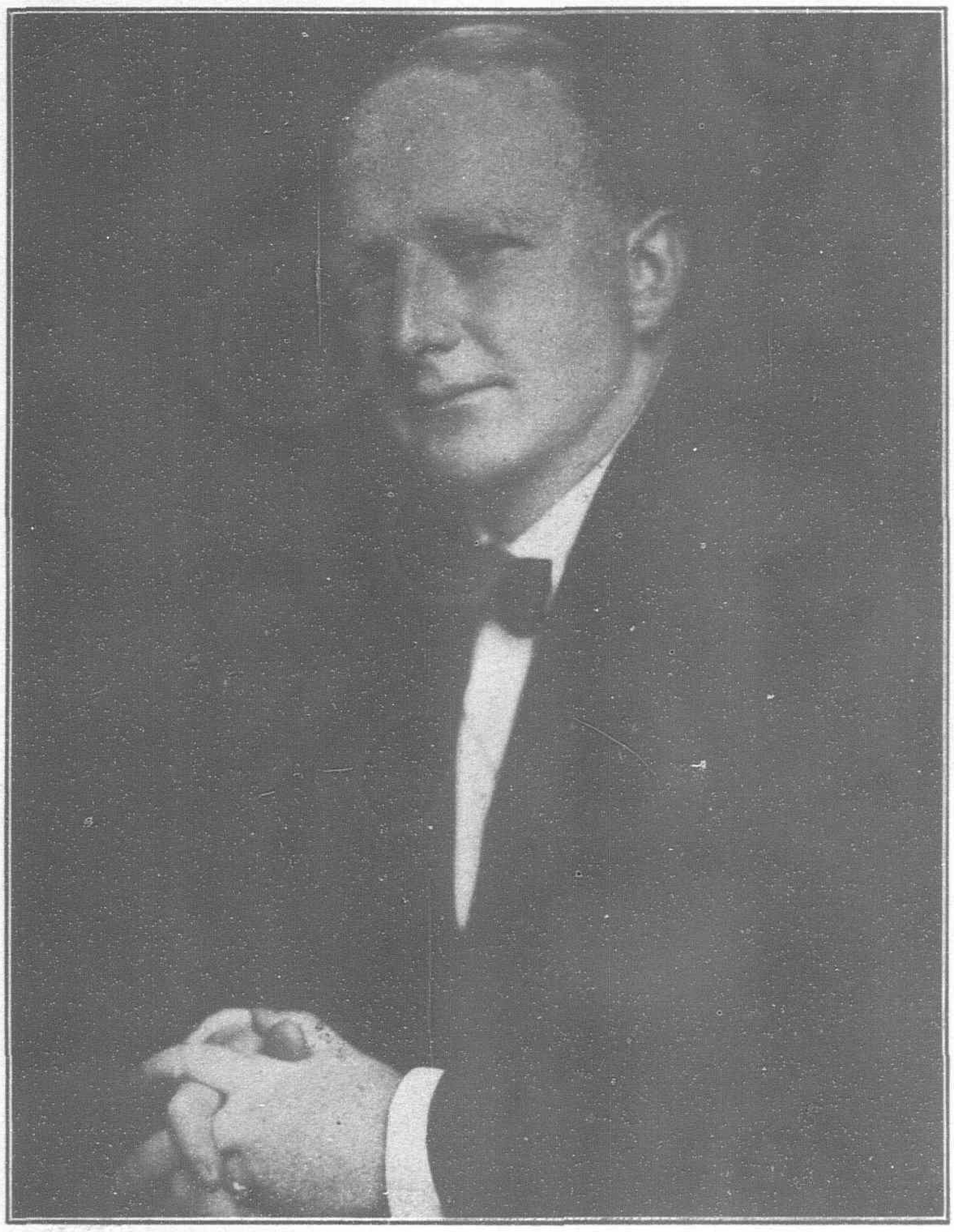
"If the commission is completely satisfied that the cost of production abroad does not exceed the invoice prices of the imported rugs, and is of the opinion that the inquiry abroad would therefore be futile because it could not affect the result of the investigation, and the President, acting on that suggestion, accepts the view of the commission and finds it impracticable, in the sense of being futile, to consider in detail the wages, costs of materials, and other items of cost of production abroad, such action, in my opinion, would be in conformity with the requirements of the statue.

"It may be that the decision of the commission not to undertake field work in Japan was made before it developed that such an inquiry could produce no information which would affect the outcome of the investigation, but if it has developed, as the result of investigation, that the decision to omit field work abroad was right, it is unimportant that the justification for the decision may not have been apparent when the decision was made.

"Although the decision as to whether it is practicable to take into consideration any matters specified in the statute rests with the President, he is entitled to the benefit of the judgment of the commission on any matter which he is required to deal with, and in this case the commission may appropriately be called upon to supplement its report by expressing a definite conclusion and judgment on the question whether, on the facts of this particular case, field work abroad would produce any information which could affect the result. Nothing said in this opinion is intended to suggest that in those cases where the commission is required to undertake investigation of wages, costs of material and other items entering into costs of production in foreign countries, agents must be sent abroad for that purpose. It may often be that the required information is already available here, or may be obtained in other ways."

The Reward of Merit

THE appointment of Mr. Nelson T. Johnson, Chief of the Far Eastern Division of the State Department to Assistant Secretary of State has received unanimous commendation from the press of the country and his many friends in the Far East will heartily congratulate the department for this well merited recognition of his services. Mr. Johnson rose to his present prominence through the China service, starting his career as student interpreter at Peking twenty years ago, and coming up the ladder through the grades of vice consul, consul, consul-general, consul-general at large, Assistant Chief and then Chief of the Division of Far Eastern Affairs. He knows China and Japan and is one of the most competent and fair minded authorities in the country on the problems which confront the government in its dealings with the Far East. His experience in Manchuria is of special value to the Department at this time when things are thickening in that region. He has an exceptional grasp on the origins of many of the issues which remain to be settled in this part of China. For the past two years he has been chief adviser to Secretary Kellogg on the Chinese situation and it is due largely to his cool judgment that the Department was not swept off its feet last Spring in the pressure of propaganda to influence our Government to scuttle and surrender immediately to the demands of the Nationalists. Mr. Johnson's promotion is the reward for his able handling of this situation and in his new position he will continue to guide the Administration policy.



Assistant Secretary of State Nelson T. Johnson

It is particularly gratifying to the Americans in China that there is an Assistant Secretary of State in Washington who is personally familiar with Far Eastern problems and who can, from personal experience, explain to the Secretary of State and the President of the United States, the real meaning of the superficially complex and conflicting reports which emanate from China. It is not at all surprising that events in China are so often incomprehensible even to the most intelligent of men, for the normal social and psychological processes to which we are accustomed in the West, do not seem to function here. The historical experience of the Chinese people has been so different during the past two or three centuries, that popular reactions are usually in directions which the uninitiated westerner does not anticipate. As the Far East becomes increasingly more important in American politics, the value of expert knowledge and opinion becomes constantly more necessary. For, more and more, China attracts pseudo-scholarly individuals, who, having no previous experience with the peoples of these countries, jump to conclusions which are false and far-fetched and make recommendations which would be as harmful to China as to the foreigners here. The State Department could not, therefore, have done a better service to itself and to the people of the United States than to take one of the most successful men in the China service and to elevate him to a position of eminence in the Government service. We congratulate the Department as well as Mr. Johnson.

The return of Mr. John Van A. MacMurray to Peking, complements the wisdom of Mr. Johnson's appointment. Every radical group within the United States and in China, has been voicing its opposition to Mr. MacMurray, because he has declined to associate American policy with that of Soviet Russia in China. The wisdom of Mr. MacMurray's attitude is apparent at this moment when the Nationalist Government in Nanking determines to drive all Russians out of their territory, starting by handing to the Russian Consul-General in Shanghai, his passports. The American radicals have been repudiated by the very government and party which they supported. Mr. MacMurrary and the State Department have been proved correct from every standpoint. Time has borne out their wisdom.

Mr. MacMurray's return to China as American Minister is the answer of the American Government to the ill-advised campaign led by Mr. Thomas F. Millard to have him removed for his uncompromising stand in favor of adequate protection to American lives and properties in co-operation with other Powers at a time when such protection was urgently needed. American business-men interested in China have been amazed at the spectacle presented by Mr. Millard who attacked the American Minister and the American business man in China at a time when American interests were placed in jeopardy. From the time that Mr. Millard appeared before the Institute of Politics at Williamstown last August and denounced Minister MacMurray and the American Chamber of Commerce, there is ample evidence that a determined campaign has been under way to have our Minister to China removed as soon as Congress met in December. That this was the sole aim of Mr. Millard is clearly indicated by his article published in *Asia* and the public advertisements announcing the appearance of the article.

There is not and never has been any real disagreement between the State Department and its representative in Peking, and even if had there been, it is reasonable to suppose that Mr. MacMurray had a better understanding of our obligations and commitments under the treaties than any other official connected with our Government. Our Minister to China stands to-day as the best qualified man in our Foreign Service to represent his country in Peking. He has been specially trained for the post and is known and recognized as the foremost American authority on the treaties with that country. China has no better friend in the United States than Minister MacMurray, but there are times when even an American places his duty towards his own country before his friendship for another. The time is past when an American's patriotism and loyalty is measured by his allegiance to China. Minister MacMurray placed his oath of office and his patriotism above his natural feeling of sympathy towards a people whose cause he so ably and successfully championed at the Washington Conference. He deserves every credit and the support of his countrymen and his government.

The American Government is determined that the lives and properties of American citizens in China shall be adequately protected

John Van A. MacMurray, U. S. Minister to Peking

E. S. Cunningham, U. S. Consul-General at Shanghai

wherever strategically possible and, that the existing treaties shall be complied with until a government representative of a united China is established and functioning. It stands squarely upon its treaty rights. It is prepared to give a square deal to China, but expects reciprocity. Americans in China are also entitled to a square deal and Minister MacMurray returns to China to see that we get it.

In a country as huge and as divided as China, the Minister must be supplemented and supported by Consuls-General, who are able, honest, fearless and efficient. The United States, at this time, is particularly fortunate in its Consul-Generals in the principal political and commercial centers of the country. In Shanghai, Tientsin, Hankow, Canton and in even smaller ports the Consuls are playing an increasingly more important role as diplomatic agents. For, as long as in many regions of China, separate governments exist it is necessary that the American officials who deal with each one of these governments be men of outstanding ability.

The dean of the American Consular Service in China, Mr. E. S. Cunningham, has for almost three decades served the United States in various parts of the world. He has been in China more than 15 years and in Shanghai almost ten. He is Senior Consul in Shanghai which provides him with a social and political position in this place, second to none. A man of unusual abilities, he has easily assumed a leadership, which all foreigners in Shanghai, have recognized. He has been able to handle the intricate problems which have confronted foreign officials here since 1925, with such wisdom and acumen that he has protected American life, property and prestige, without antagonizing the Chinese, who regard him as a friend of their country. Such a man at this moment is invaluable in such a post and the United States is particularly fortunate in having retained Mr. Cunningham at Shanghai. The combination of Johnson, MacMurray and Cunningham in Washington, Peking and Shanghai ought to make for a wise, moderate and broad American policy in China without sacrificing American rights for the chimeras of probable Chinese unity—until unity is achieved. And China may easily rest assured that such men will see that justice is done to China, when it is at all possible.

Origins of the Anglo-Japanese Alliance

The first and second volumes of " British Documents on the Origin of the War, 1889 to 1914 " recently published disclose that only after repeated efforts to achieve an Anglo-German agreement had been rudely defeated by Germany that Great Britain sought Japanese co-operation. The rudeness of the German reply to the British Foreign Secretary had the effect of hastening the completion of the negotiations with Japan then well under way. The German rebuff to Lord Lansdowne's overtures was, in fact, one of the main causes of the Anglo-Japanese Alliance.

The disclosures in these volumes provide further evidence, if any be needed, that the visible manifestations of the secret working of the Sino-Russian treaty of alliance of 1896 which let Russia into Manchuria and provided her with a deep and warm water port at Port Arthur were interpreted aright by the Power whose interests in Asia were directly menaced by the secret agreement.

Out of Kimono into Overall

The Industrial Transition in Japan

By *MAURICE HOLLAND, Director, Division of Engineering and Industrial Research, National Research Council*

A Report of Investigations Conducted in Connection with the Third Pan-Pacific Science Congress, Tokyo, October-November, 1926

One of the most remarkable tributes to Japanese efficiency from a highly-qualified and expert investigator, specially delegated for this difficult task, is given in the following Report to the National Research Council, by Mr. Maurice Holland, Director of its Engineering and Industrial Research Division. No longer is Japan dependent upon an imported technology. Thirty thousand engineers are enrolled in the membership of her national engineering societies. Ninety research institutions are listed by the Department of Commerce and Industry all conducting laboratories and contributing their knowledge in the race for economic supremacy. In the same way that Japan set out to learn and master Western methods of defense, which has preserved intact her independence and carried her in fifty years to the third rank in military and naval power, so she is determined to leave no stone unturned to learn the secrets of our economic supremacy. It is hard going to change from kimonos into overalls in two generations. It is difficult to transform the old Japanese artisan into a modern mechanic, able to compete with nations which have an advantage of a century of industrial training and traditions. But Japan is doing it. The Ministry of Commerce has planned the use of Yen 45,000,000 over a period of years to encourage certain key industries and the bulk of this subsidy will be expended in the engineering trades. That Japan now occupies third place in the organization of industrial research amongst the nations of the world, being surpassed only by Germany and the United States, will come as a surprise to those who refuse to believe in her progress.

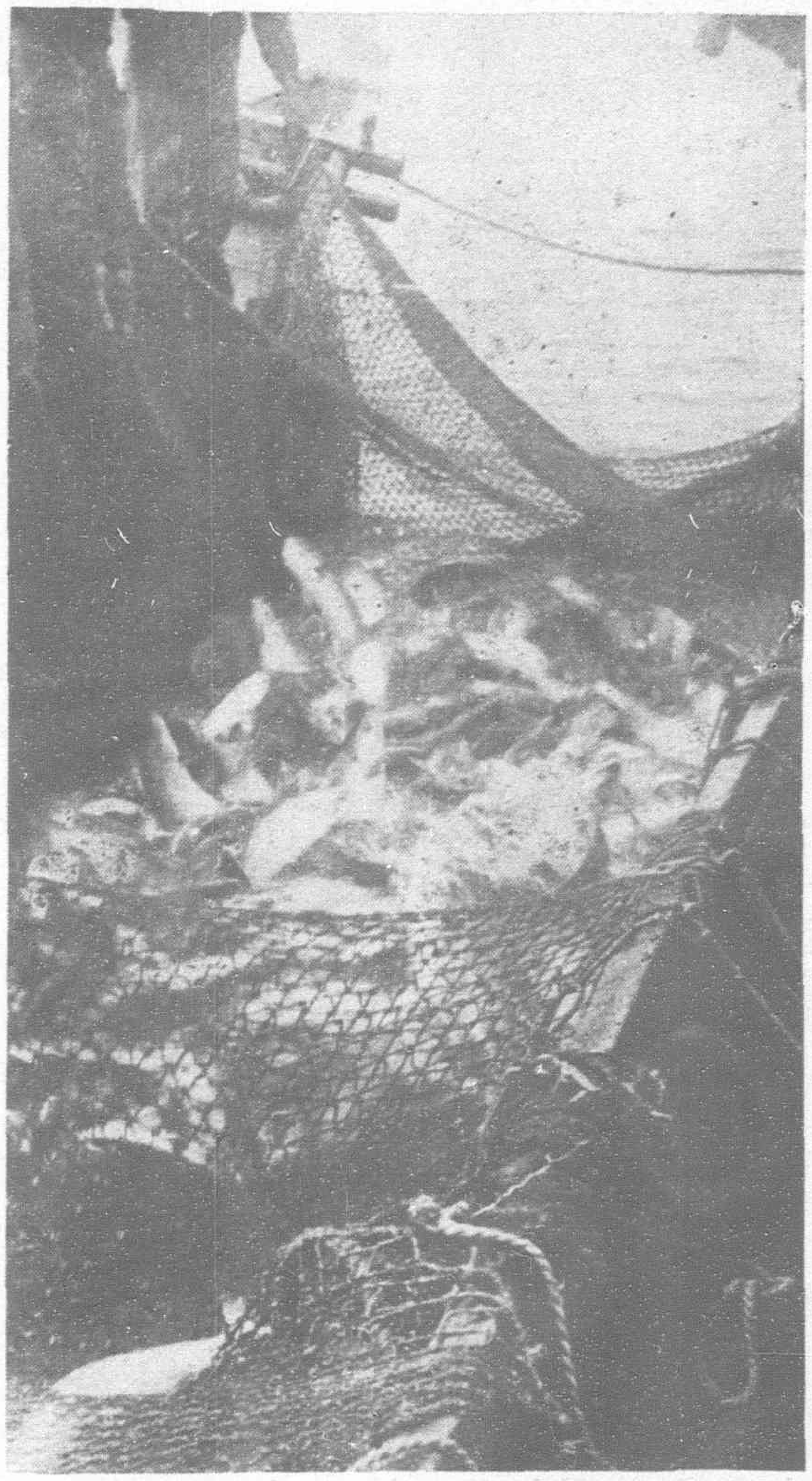
IN general the National Organization of Research in Japan follows the German system in that the leading institutions in representative fields of science and industry are heavily subsidized or otherwise supported by the Imperial Government. Of the 90 research institutions listed by the Department of Commerce and Industry 23 are supported by the National Treasury with an aggregate appropriation of four and a half million yen annually. Statistics of expenditures for such national institutions as the Research Institutes of the Army, Naval Fuel Bureau, Imperial Railways and Government Steel Works are not reported and would probably increase the total expenditures for this class 20 to 25 per cent. Forty-four Research Institutes supported by the Prefectures and Municipalities have a total annual budget of Y.2,100,000. Twenty-one institutions in a third classification, namely those attached to private concerns show a total of Y.1,400,000 annual appropriation for research —bringing the grand total for the three classes of Research Institutes *i.e.* National, Municipal, and Private up to Y.8,000,000 about G. $4,000,000 as the reported figures.

Maurice Holland, Director, Division of Engineering and Industrial Research Division, National Research Council, Investigator and Author of One of the Most Remarkable Tributes to Japanese Engineering Efficiency.

Practically all fields of science and most representative basic industries are being served by one or more research institutes. Among the more important National Institutes are the Tokyo and Osaka Industrial Research Institutes which are working in close co-operation with the industries on general research problems arising in these important centres. Other fields of research are represented in Institutes for Fuel, Nitrogen, Pottery, Silk, Sericulture, Brewing, Iron and Steel, Electrotechnical, Aeronautics and Fuel and Ore Dressing as well as Central Research Laboratory operating in Korea. Research Institutes supported by Municipalities include those for Silk, Fisheries and industries of localized character.

In order to obtain a representative cross-section of general organization of research in Japan an attempt was made to trace the evolution of industrial technology from the original source; in most instances academic or pure science research agencies, through those supported by industrial associations or private concerns to the industrial application in manufacturing concerns.

Fisheries, as an industry, was selected for investigation and detailed study because of its relative importance, being rated fifth among all the industries of Japan and for the reason that the technology of Fisheries and its products is believed to be more highly developed in Japan than any other place in the world. The aeronautical industry as developed in Japan offered an interesting comparison—one of the newest industries compared with Fisheries one of the oldest. Furthermore until very recently the aeronautical industry was largely under foreign influence—dependent upon an imported technology. The whole industry was honey-combed with German, English, and French advisers, engineers, and technicians. The importance of the silk industry would have made complete investigation instructive and profitable if it were not for the fact that every phase of the industry has been so completely reported upon and the added fact that the high state of its scientific and technical development is largely attributed to the pressure of buyers' requirements and specifications. Since America is the customer for 90 per cent. of the entire output of the industry the common interest of the two countries has already developed the closest co-operation and intimate exchange of data along scientific, technical, industrial and commercial lines to such an extent that the raw silk industry of Japan may almost be considered a home industry of the United States.



Bringing in the Catch

In order to round out the picture and to establish more clearly the relation, functions, and operation of the two principal classes of Research Institutes, that is, National and Industrial, a brief description of two of the more important agencies of each type will be included.

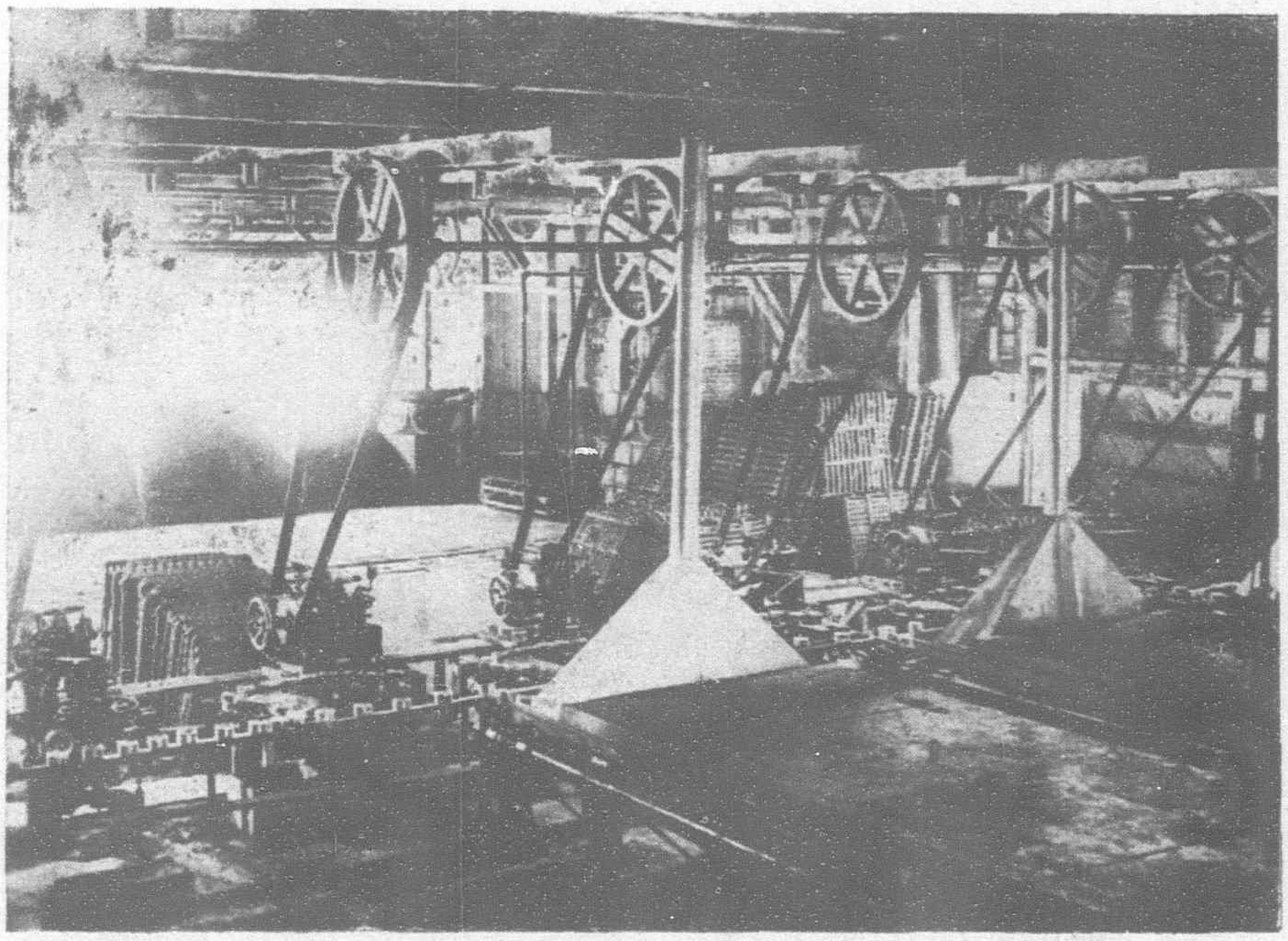
A brief reference to industrial plant-housing, wage scale, illumination, safety devices, American-made tools, as observed in one or two representative plants, will be made for purposes of comparison.

The Fisheries Industry

National supervision and control of the fisheries industry in Japan is centered in the *Bureau of Fisheries of the Department of Agriculture and Forestry*. The Bureau is divided into two sections, *i.e.* Regulation, and Industrial. The work of these sections is supplemented by a Section of Statistics, a general section of the Department. According to the Director of the Bureau the home consumption of fish is doubling every ten years. The total export of fisheries products is in large measure due to the increase in wages of the officers and crews of fishing vessels. A comparison of the 1925 rate of pay with the 1924 scale furnishes some proof to support this contention. Captains of fishing vessels in 1925 received Y.4.56 per day against Y.4.06 for 1924. Chief engineers Y.3.94 as against Y3.81 in 1924 and proportionate increases for boatsmen, oilers and fishermen. The cause of the increase is thought to be due largely to natural promotion. The officials of the Bureau admitted that the statistics on the fisheries industry published annually by the Department are misleading unless interpreted with proper regard for the source and methods used in compilation. The funds of the Bureau of Fisheries do not permit the employment of a field staff and therefore the Bureau is dependent upon the figures submitted by the Municipalities and Prefectures which are admittedly incomplete and computed by different standards which do not permit uniform correlation, for example, in making direct comparisons with the statistics of the fisheries industry in the United States, particularly in the number of employees and the value of unit production. The statistics of employees in Japan include the family of the wage earners who assist in certain phases of the work. It was pointed out that the explanation of the low value of unit production lay in the fact that a large number of the workers were employed only part time. The need for more accurate statistics has been appreciated and some effort is being made to obtain the necessary appropriations for statistical surveys.

The Bureau co-operating with the Department of Home Industry has made extensive investigations of the food problems. The most reliable figure obtainable placed the consumption of fish at 7 grams per person per day while meat averages about 1/10th that amount. The authorities of the Department of Home Industry estimate that a person weighing 120 pounds requires 22 grams of fish per day and therefore the burden of devising means for increasing the production of fisheries products by 300 per cent. has been placed on the Bureau of Fisheries. Some plans under consideration at present include the utilization of shallow waters in bays and in rivers and lakes for fish and shell fish culture, more intensive development of fishing vessel design to effect economies in operation, more extensive use of labor saving devices, and automatic machinery as used in the Pacific salmon canneries.

In present practice 40 per cent. of all fish caught are utilized as fertilizer. Although there is little or no waste in present operating methods an effort will be made to convert 20 to 30 per cent. of the fish now being used as fertilizer to



Japanese Salmon Cannaries

edible products. Up to the present, by-product development has received scant attention. More intensive development of by-products of higher value and mass production methods employed in American canneries will be the goal of the future development program. *The Imperial Fisheries Institute* operated directly under the supervision of the Bureau of Fisheries and supported by the Government is the national centre of scientific research and technical development of the industry in Japan. The work of the Institute is supplemented by Research laboratories, experimental stations, and hatcheries operated in and supported by each of the 45 Prefectures into which the Empire is divided. Although in some instances the research or experimental work of fisheries institutes located in Municipalities or Prefectures may be in some degree localized, or limited to the type of marine products common to that geographical area, in general the major sections of the work is divided into Fish Culture, Technology and Fisheries, the last division being charged with problems of an industrial character. The Imperial Fisheries Institute located in the outskirts of Tokyo is the central clearing house for fundamental research. Investigations are in progress on all phases of the industry: problems in zoology, life history, habits and migrations of various species, the nutrition value of fish, shell fish, and seaweeds, the development of by-products, improvements in process technology, apparatus, and methods of capture. One section of the Institute charged with improvement in fishing vessel design operates a model tank and co-operates with designers and constructors in an effort to reduce operating costs and improve performance. All modern trawlers are being equipped with Diesel engines built in Japan. The principal emphasis of the investigations in progress is in the direction of increasing basic production, the introduction of new species rather than the refinement of present methods and improving technology.

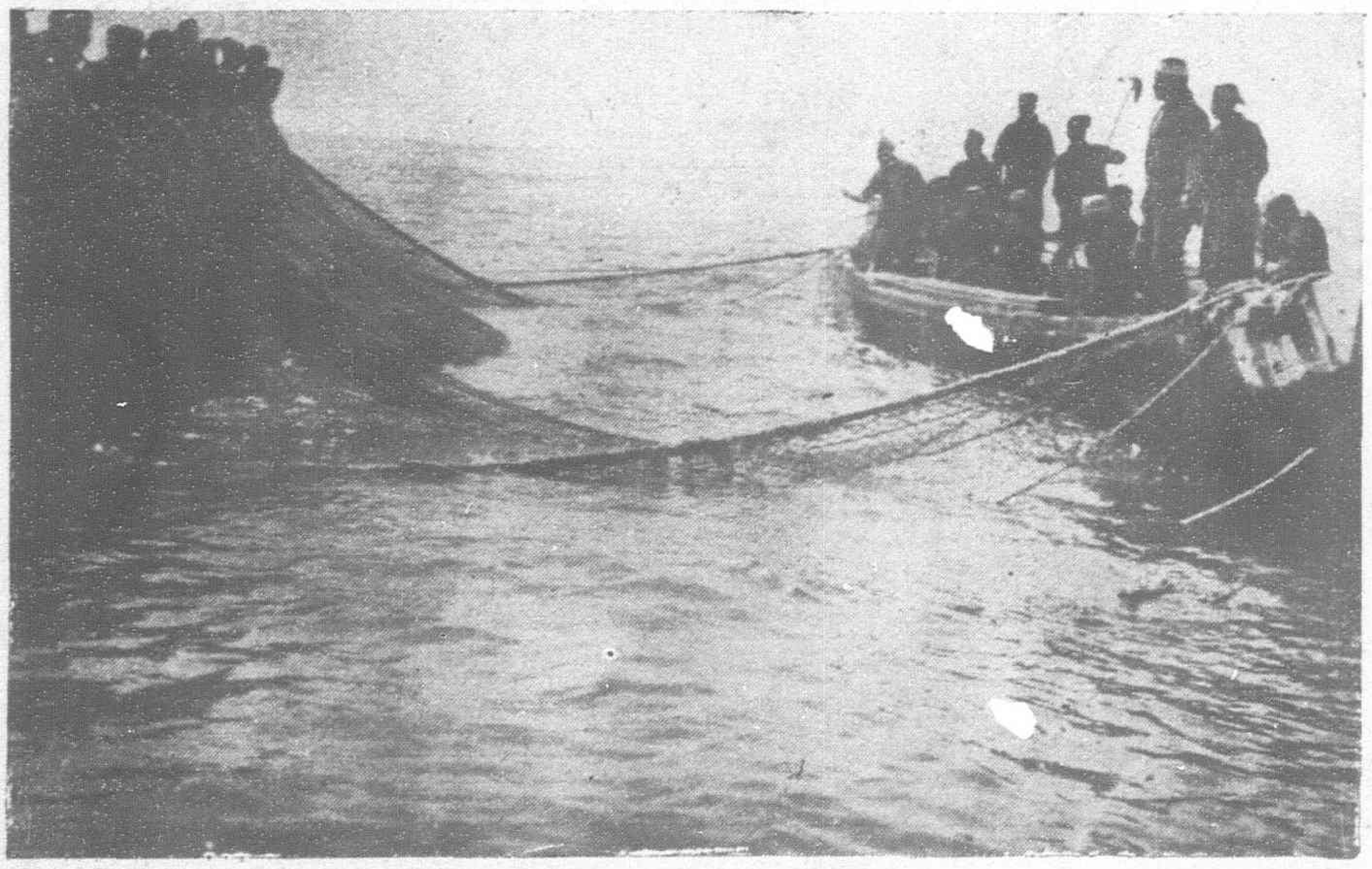
Unloading the Catch

An equally important function of the Institute is educational. At present no less than 320 young men are in training as students in various branches of the fisheries industry. Intensive theoretical courses are given at the Institute and are supplemented by practical experience in operating training ships under service conditions. After graduation the students become captains of fishing vessels, research workers at the experimental stations of the Municipalities or Prefectures, designers or constructors of fishing vessels in the shipyards of manufacturers, while others are appointed as instructors in the College of Fisheries, universities, or remain at the Institute, and the balance, about 1/3, obtain employment with private concerns in the industry.

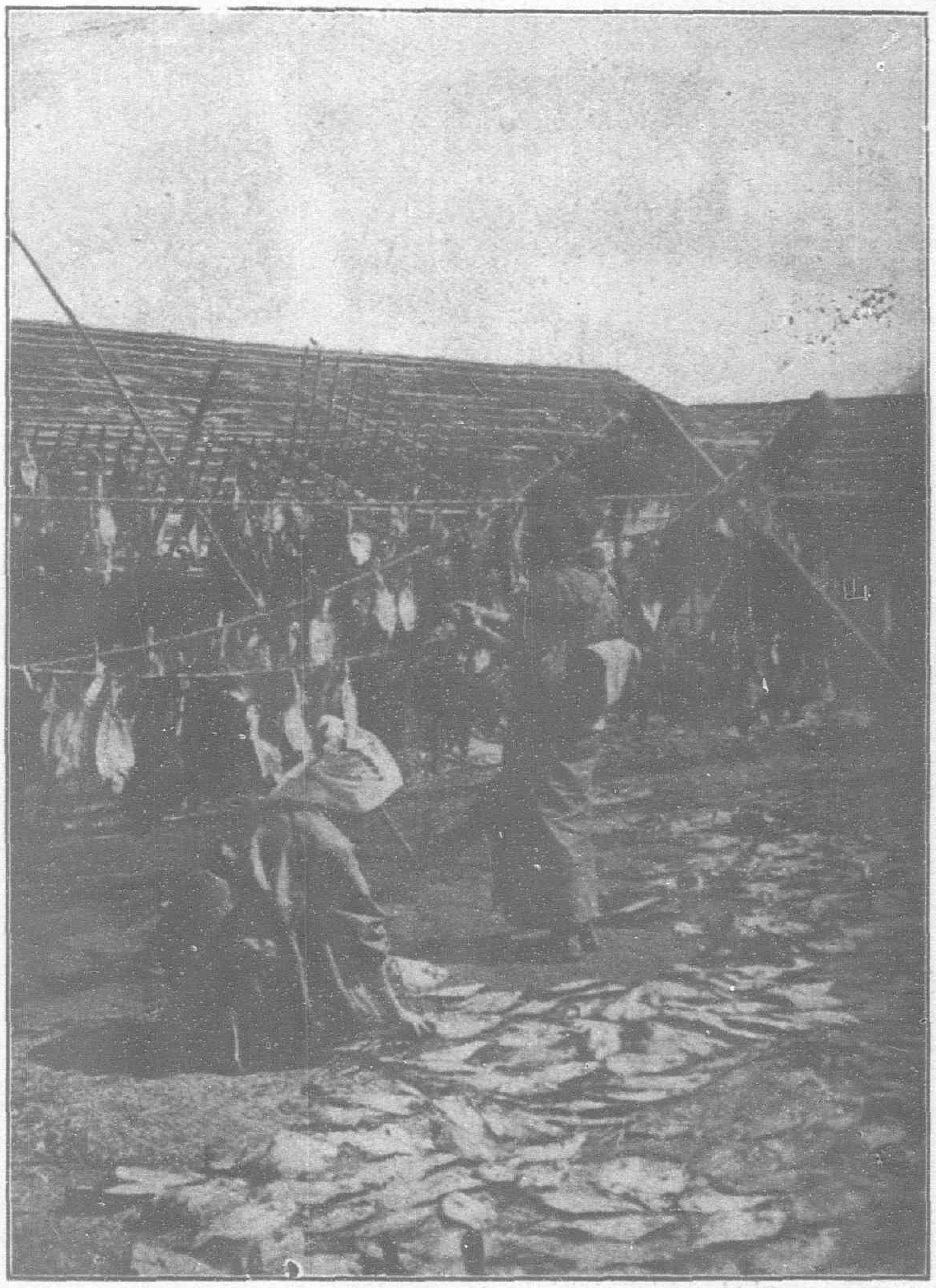
The Imperial Fisheries Institute is the pure science agency; it is the primary source of fundamental data and is the national organization supported by the Government to furnish the basic material for improved technology and trained personnel to the industry. The staff of the Institute numbers 50 and the budget is $1,750,000 of which $206,000 is spent on fisheries problems directly, $60,000 on salaries, and $150,000 on other expenses. The relative importance of fisheries among other industries may be better understood when the most reliable statistics and industrial authorities agree that fish and fisheries products occupy fifth place among the industries of Japan, the value of the annual catch being $127,000,000.

The Chitose Hatchery in Hokkaido, one of the largest in Japan if not in the Orient, specializes in salmon and exemplifies the supplementary work of local governments. The principal salmon fisheries of Japan are located in the northern sections, particularly, Hokkaido. The Chitose hatchery is engaged principally in fish culture operations of salmon, with some effort being directed at the importation and cultivation of new species of trout. With an annual appropriation of $35,000 a year for experimental work this station handles 50 million salmon eggs a year with an average operating efficiency of 97 per cent. of the eggs hatched.

The College of Fisheries at the University of Hokkaido, with a registration at present of 120 students, works in close co-operation with the experimental work of the Hatchery and maintains intimate contact with the local industry. The general distribution of the principal species around the Island of Hokkaido is as follows: Northern Section—salmon, crab and cod; Southern—sardine, cuttlefish and mackerel; Eastern,—sardine; and Western—herring. One of the more important investigations recently completed by the staff of the College of Fisheries was the tracing of the migrations of 16 flat species through study of parasites common to these species. Aside from the utilization of by-products for fertilizer, some attempt has been made to make moisture proof shoes from porpoise skin, and a limited market has been found for a fish sauce made from cuttlefish liver. The local research and experimental station supported by the Prefectures and operating in co-operation with the University, is making an effort to bridge the gap between academic or pure science investigations and the day-to-day technical problems which are hindering the progress of the industry.


Deep Sea Net Fishing

Hayatomo Fisheries Investigation Association: The nearest approach to an applied research agency operating in the Fisheries industry is the Hayatomo Suisan at Shimonoseki. There are no research laboratories connected directly with or supported by private companies. The Hayatomo is the only association research activity operated by the industry. The stated objects of the Association are making inquiries, experiments, designs and general investigations regarding fisheries. Eleven member companies including trawling companies, canners, inshore fisheries, manufacturers of fishing gear, fish meal companies, and brokers support the association on a pro-rated assessment based on capitalization. The annual budget is $15,000. The administration of the Association is vested in a Board of Councillors selected from the directors of the member companies. The staff of the Association consists of a manager, assistant manager, two engineers and a secretary. The Councillors are distributed and assigned to advisory committees in charge of investigations in which they are most experienced. Investigations include studies of fishing grounds, migrations of certain species, improvement of apparatus and gear, development of new methods of capture, handling and refrigeration and improved design of fishing vessel and engines. In general the problems are of broad, fundamental character of importance and value to the whole group. A small laboratory is maintained at Shimonoseki, the commercial center of the industry. Improvements in technology and processes, as well as new devices after successful development in the laboratory, are proven on commercial scale in the plants of the member companies. One example of process development which the Association research laboratory initiated and carried through to commercial scale production is the manufacture of two grades of fish meal or paste which is now firmly established as a fish-product commodity and sold in markets throughout Japan. The superior grade made from species of fish which have low market value, as fresh fish, is known as Kamoboka and is sold in a half cylindrical loaf about eight inches long and two inches thick, it weighs about half a pound and is sold for about 15 cents. The inferior grade known as Chicua is made in hollow cylinders about 7 inches long and one inch in diameter and is sold to the poorer classes for about 1½ cents in our money. This product is made from poorer quality fish and scrap. The importance of this product as a staple product in the diet of the laboring classes is indicated in the volume of the sales figures for last year when 10 million sticks of Chicua was made and sold by one company. The entire process of grinding, molding, and cooking, in accordance with the best mass production practice and automatic machinery, was developed by the Association laboratory.



Preserving Fish by Drying in the Sun

The Association sends committees of its members to Europe and America regularly to investigate the improvements and developments of the industry in the most important centres. Recognized authorities on various phases of the industry in Japan and frequently from abroad are invited to come before the Association and lecture on their subjects.

The Kyodogyogyo, translated literally, meaning the Union Fisheries Company, is the largest single fisheries company in Japan. Of the 70 deep sea trawlers restricted to 150 tons which the Government allows to be operated in Japan, 28 are directly owned by this Company and 8 additional by its subsidiary companies. The Kyodogyogyo also has large interests and investments in most of the smaller trawling companies and in some inshore fishing companies. The fishing grounds around the Island of Japan are definitely zoned and restricted by Government regulation. The inshore fisheries are protected by restricting the field of operation of deep sea trawlers to zones or certain number of miles off shore.

All the trawlers operated by the Union Fisheries Company are motored with Diesel engines and all but one or two are equipped with radio. The trawlers operated in pairs and are out on an average of two weeks and make 30 to 50 hauls per trip. The marketing and merchandizing of the catch is highly organized and elaborately secheduled to maintain uniform market value.

The whole area of the fishing grounds on which the fleet operates is blocked off in numbered squares, 64 miles square. Every morning the central office at Shimonoseki telephones to the principal centres of demand in representative cities such as Nagoya, Osaka, Kobe, and Tokyo, to determine the selling price of the principal varieties of fish for that day. Using a weighted factor based on the volume of demand which is averaged for the year in each city, the average wholesale selling price for each city is worked out by a prescribed formula and set for the day. The selling price for the principal varieties in the different markets is sent by radio to the captain of the fishing fleet who in the meantime has sent in his exact position, amount of haul, and kind of fish to the central office. With the data received from the central office he can figure the exact market value of his catch and is directed to proceed to that port and market determined by the central office as most profitable. The plan of marketing allows a uniform distribution of the catch according to demand and prevents breaking the market price through poor distribution. The skippers and crews of the fishing vessels work on base pay and bonus of a share in the profits. This creates a spirit of rivalry among the ships of the fleet and offers an inducement to the captains to make a thorough study of the grounds to determine areas of high productivity which, needless to say, are jealously guarded trade secrets, even among the rival vessels of a fleet belonging to a single company. A further advantage, as the Managing Director pointed out, in the system, is that it creates an *esprit de corps* among the officers and crew of each vessel. Aside from the manufacture of fish meal described above, and the utilization of waste as cattle feed and fertilizer, little or no effort has been made by the company to develop by-products of higher value. The major effort at present is to increase the commercial turnover of fresh fish. The production and sale of frozen fillets marketed in cans are being developed on an experimental scale. Results thus far indicate that there are no serious obstacles to expansion on a commercial scale. Several new products including shell fish, oysters, clams, and scallop, and several varieties of fish including swordfish and halibut will be tried as canned products for export to America and Europe. In line with the policy of the Bureau of Fisheries previously mentioned, serious and extensive efforts will be undertaken in the near future to utilize the shallow waters around the Islands as well as lakes and rivers for the cultivation of fish and marine products which can be produced in this environment.

Of the general development of technology in the fisheries industry, taking into consideration the work in the scientific institutes of the government, organized association research, and technical development in the industry, it may be said that developments fall in three general classifications. In fisheries industry development, such researches as investigations of net preservatives, improvements in fish and vessel design and construction, and gasoline engine development, is receiving considerable attention. A new design of fishing vessel to be used in bonito fishing is made of steel and powered with a 250 h.p. Diesel engine. One-third of the development cost of this type of vessel was subsidized by the government. This branch of research also conducts investigations on other types of fishing gear and apparatus.

In the technology section, itself, such matters as development of canning methods, preservation, salting, and drying of fish, improved refrigeration methods, and the development of by-products such as fish oil, meal, and fertilizer concludes the subjects of principal interest. Some technologic investigations on seaweed and salt are being prosecuted.

The elaborate organization for the conduct of experiments in fish culture and acquiculture is a good indication that the principal effort of the whole research program is stimulated principally by a desire to increase basic production. In fish culture, experiment stations are divided in sections, those for fresh-water fish culture having two branches, one for ground-water development which includes salmon and trout culture, and a second branch of warm-water fish culture which include carp, sol, and mullet culture. A second section is exclusively devoted to salt-water fish culture and is divided into a bi-valve branch, being specifically charged with oyster, clam, and shell fish culture, and a second branch devoted to marine fish culture such as bass, mullet and porgy.

Branches of the Imperial Fisheries Institute specializing in the development of certain species of fish or perhaps of cultivation are located in the Prefectures whose local waters are most adaptable for experiment and cultivation.

The College of Fisheries of two Imperial Universities, namely, Tokyo and Hokkaido, work in close co-operation with the Imperial Fisheries Institute, and the staff of these colleges carry on pure science for academic investigations in ichthyology and zoology in the interest of the industry as a whole and perform an equally important function in serving as a training school for the future supply of technically-trained men who will enter government research institutes and the fisheries industry.

Engineering Efficiency

Tokyo Fish Market: Having traced the evolution of technology in the fisheries industry from the pure science source, The Imperial Fisheries Institute, through representative agencies of applied science, such as the Hayotamo Research Association, and having noted the influence and application in one of the largest producing units in the Industry, the Kyodogyogyo, our picture would be incomplete without a brief glance at the problems of marketing as represented in the Tokyo Fish Market, one of the largest in Japan—the meeting ground of industry's production and comsumption demand.

In this market 4,000 dealers are regularly engaged in the fish business and 15,000 mongers come daily for their stock in trade; 200 common species of fish are dealt in regularly, 530 tons of fish being handled daily. The Market is subsidized by the city of Tokyo, although a fraction of the maintenance cost is derived from license fees for dealers' stalls which are 6 feet square and rent for about $30 a year.

The average time of the deep sea fisheries products to reach the market is 22 days; while inshore products are received fresh daily.

Plans have been prepared for a new market which will be built by the city of Tokyo at a cost of $5,000,000. Some of the advantages which are expected to be realized in the new market are improvements in methods of transfer from fishing vessels to stalls and for shipment in cars and smoother general operation by improved layout and organization. Retail price of all common varieties of fish will be published by the market daily in an effort to stabilize the price of fish to the consumer. Asked whether in his opinion a system of federal inspection of fish and fisheries products would increase the volume of sales the Director of the Market stated that in his opinion federal inspection would be impractical, involve too much labor, and on account of the inherent, unstable character of the surface of fish there was small chance of devising a method of marking after inspection which would have any permanent value.

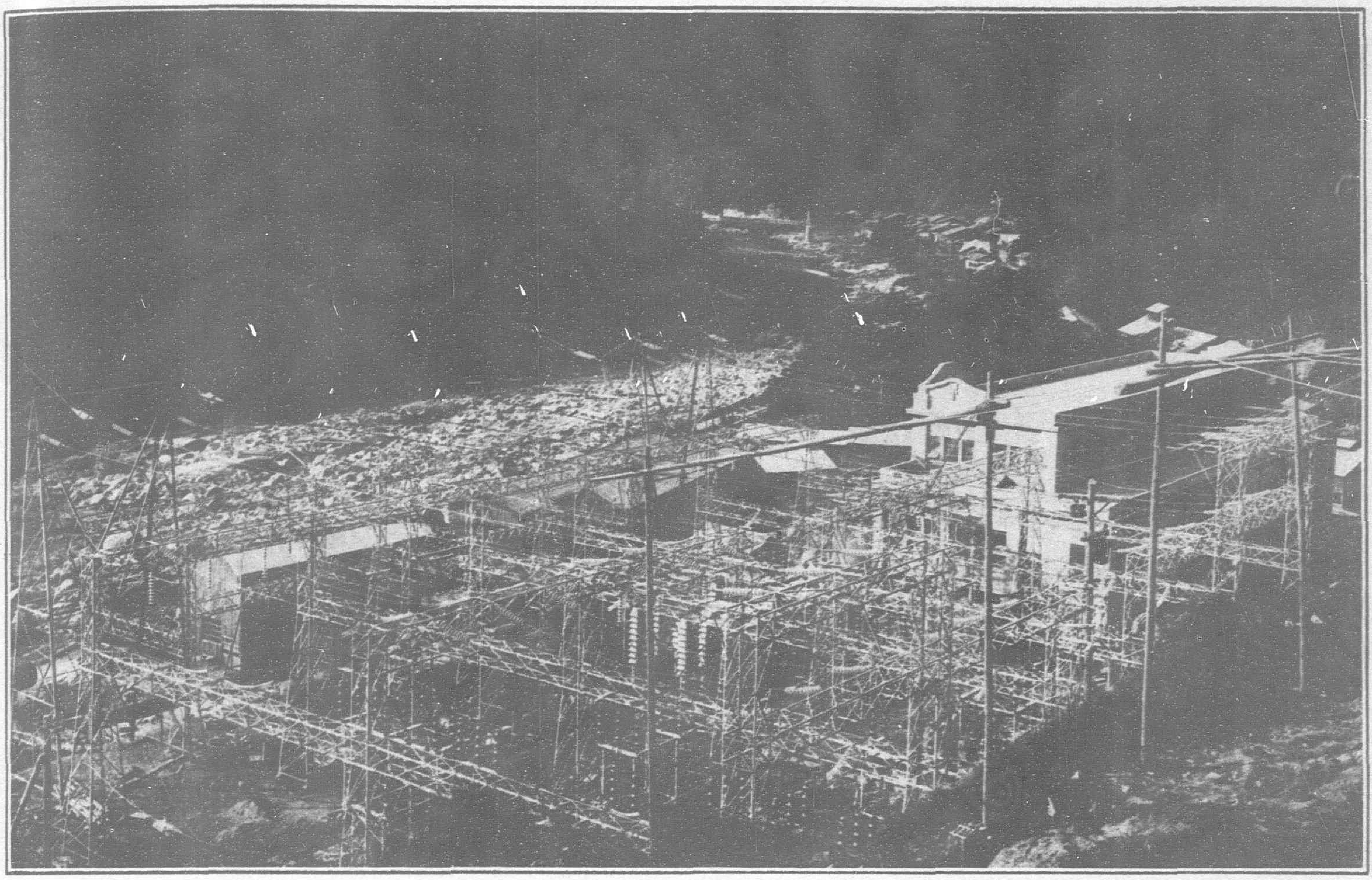
Mikimoto Pearl Culture Station: Because of the widespread interest in Japanese cultured pearls, and as this work represents the highest development of fisheries technology, a detailed investigation of the process was made on a visit to the Mikimoto Pearl Culture Station at Gokasho near Toba. Few foreigners have been given an opportunity to visit the station and less than half a dozen have been the guest of the family whose name is synonymous with the industry in Japan and had the process explained in detail. The principal station, one of eight now operated by the company, is located in a secluded Bay at Gokasho. The total area of the stations is nearly 41,000 acres. Three million pearl oysters are planted yearly and the annual value of pearl production averages $1,000,000. One thousand employees are engaged in the enterprise.

The Gokasho Bay station is the largest and most representative of the group. Fifty thousand cages are installed with an average of 140 pearl oysters to the cage making a total of some 7 million oysters under cultivation at one time. About a million reach maturity each year. The loss averages 25 per cent. to 30 per cent. so that the productive yield is 6 to 700,000. Although the life cycle of the oyster is 12 years the nucleus is not inserted until the oyster is three years old and remains in cultivation for 5 to 6 years representing the period of prime activity and the maximum production of pearl essence.

The process consists essentially of inserting a perfect sphere of polished Mission River mussel shell about 3/16-in. diameter into the living oyster between the stomach and the kidney. Upon the skillful execution of this delicate surgical operation the success or failure of cultured pearl production depends. After the nucleus is inserted the oysters are set on shelves of an iron cage of vertical box-like form containing 7 shelves, each shelf being occupied by 20 oysters. The cage is lowered to a depth of 15 feet below the surface of the water where experience has proved the best feeding material is located. In the season 200 diving girls are employed to clean the oysters, to remove foreign marine growths, and 20 are retained the year round to keep the cages clean and allow free entrance for water and food.

Mr. Mikimoto, Jr., who personally conducted my tour of investigation, explained the interesting origin of the cage in pearl culture which had been invented by his father as a more recent improvement over the original methods.

(Continued on page 567.)



The Outdoor Substation of the Seto Hydro-Electric Power Plant of the Japan Electric Power

Electric Power Transmission in Japan

Outline of Development

By Eisaburo Kusano

GEOGRAPHICALLY, Japan is a small country, but she is made up chiefly of mountains and hills which are densely covered with forestry and bush. In addition, the rainfall is rich, and therefore, there are many water sources in Japan which may be hydro-electrically developed.

According to the Government investigation of the water sources, (which was made at 1,190 spots all over Japan, covering 174 rivers and 682 branch streams of these rivers, during five years ending 1922) the theoretical horse power amounted to 8,400,000 h.p., on the low water basis, that is, available for 365 days per annum ; on the normal water basis, that is, available for 180 days per annum, the theoretical horse power totalled 14,000,000 h.p.

A large part of the foregoing water sources were found grouped together in the precipitous mountainous districts at the middle of the Main Island of Japan—the districts generally known as the Japan Alps and its vicinity.

Generally speaking, hydro-electric power is transmitted a long way from remote power plants to the urban industrial centres where the power is actually consumed. But, this is particularly so in Japan on account of the fact that rich water sources are grouped together in the Japan Alps districts, far from the urban industrial centres.

Japan is to be congratulated that these water sources are concentrated in the middle part of the Main Island, as it is shown in the accompanying map, instead of northern or southern ends of the Main Island or some other remote districts, say Kyushu or Hokkaido Islands. Neverthless, in order to reach the industrial centres of Tokyo-Yokohama, Osaka, Nagoya, and elsewhere from the power plants in the Japan Alps districts, the power has to be transmitted for a distance varying from 100 kilometres at the least to the maximum of of 300 kilometres.

Three Phases of Developments

The electric power transmission enterprise in Japan, which plays an important part in the electrical undertakings in this country on account of the inconvenient geographical distribution of the water sources, has undergone three phases of developments, namely, (1) urban transmission, (2) near distance transmission, and (3) establishment of the so-called transmission line network.

The first phase of development is a period spreading to about 12 years since the Tokyo Electric Light Company for the first time in Japan supplied electric lights within a limited area in the city of Tokyo in 1887, operating a 25-k.w. steam power station. During this period, the electric light supply enterprise was started at various parts of this country. The city of Kyoto in 1891 succeeded in generating 2,000 h.p. of power, availing itself of the Lake Biwa canal. In those days, however, the power transmission was limited within a short distance ; at its longest, the line did not extend any more than several miles, within and around any city.

In 1899, two 11,000 volt transmission lines, extending to 22.5 kilometres each were built, the one by the Koriyama Spun Silk Yarn Company from Lake Inawashiro to the town of Koriyama, and the other from a power plant outside of the city of Kure, Hiroshima Prefecture to the city. The foregoing achievement, which eventually stimulated other electrical enterprisers to draft plans for longer distance power transmission, marks the beginning of the second phase of development.

The electrical enterprises in those days, however, mainly dependent upon steampower stations, and therefore, the power transmission, too, was made within a short distance of not more than 20 miles. Meantime, the Tokyo Electric Light Company enjoyed steady growth of the demand for light supply. The company found then that it was more profitable to construct a hydro-electric power plant on the River Katsura-gawa and transmit the power to Tokyo than to operate the existing steam power station. It was in the early part of 1904. The outbreak of the Russo-Japanese War (1904-5) hindered the early realization of the foregoing plan of the Tokyo Electric Light Company to build a power plant on the Katsura-gawa, but it was completed toward the end of 1907. The capacity of the new plant was 15,000 k.w., and it was transmitted by 55,000 volt line for a distance of 80 kilometres.

When Japan's finances recovered from the depression which followed the outbreak of the Russo-Japanese War, various branches of industrial undertakings began manifesting remarkable activities all at once, and it became, then, a fever of the day to launch new industrial enterprises, resulting in the increase of the electric power consumption to such an extent that the power companies found it impossible to meet the growing demand unless their capacity be extended at a drastic scale.

The foregoing two factors, *i.e.*, industrial activities and the urgent necessity of extending the power generating capacity on the part of the electric companies, coupled with the stimulation given by the Tokyo Electric Light Company's success in transmitting the power from the Komabashi Power Plant on the Katsura-gawa to Tokyo, gave rise to various plans of developing remote water sources on a large scale.

Long Distance Transmission

In the course of 1913-4, the Kinugawa, the Inawashiro, and the Ujigawa Electric Power Companies constructed large power plants connected with extensive transmission lines.

The Inawashiro Hydro-Electric Power Company, among others was then regarded as one of the most progressive companies in the world in points of the completeness of its equipment, the long distance of its transmission lines, and the high voltage of the lines. This company transmitted 37,500-kw. of power (which was increased to 61,500-kw. soon afterwards) by 110,000 volt line for a distance of 140 miles or 225 kilometres from Lake Inawashiro to the suburbs of Tokyo.

Prior to the construction of the 110,000 volt line by the Inawashiro, it was feared that the enterprise would fail in those days, there were only two instances in the United States in which the power was transmitted at such high voltage as more than 100,000 volts. Thanks to the cautious and yet enthusiastic efforts of the enterprising designers, the line was successfully built, and ever since, the power transmission has been done satisfactorily to the present day.

One of the important results of the construction of the Inawashiro-Tokyo transmission line is that it gave confidence to the Japanese electrical entrepreneurs that they can transmit power at high voltage and for any long distance.

Like all the other branches of industrial undertakings in Japan, the hydro-electrical enterprise made further development during the unprecedented financial boom which resulted from the outbreak of the European War. The war boom brought forth remarkable activities of manufacturing industries of all lines, and the consequent advance in the market price of coal. Further hydro-electrical development of the water sources has thus become a necessity.

Stimulated by the urgent need of extending their capacity, to cope with the situation, and encouraged by the Inawashiro's success at long distance power transmission, the electric enterprisers planned construction of power plants in the Japan Alps and Hokuriku districts in order to supply more power in the industrial centres of Tokyo-Yokohama, as well as in Nagoya and Osaka; these plans were carried out one after the other in rapid succession.

In 1923, the Keihin (Tokyo-Yokohama) Electric Power Company constructed a power plant on the upper stream of the Shinano-gawa, and transmitted 77,000-kw. of power by 154,000 volt line. Following the completion of this line, numbers of other 154,000 volt lines were built from the Japan Alps districts towards the Tokyo-Yokohama districts and also to Nagoya and Osaka. The total distance of these high voltage lines amounted to approximately 600 miles, and the power transmitted totalled about 350,000-kw.

Transmission Line Network

The first stage of the power transmission line network was completed in 1923. They are the lines which are shown in the accompanying with continued lines, their capacity being higher than 110,000 volts; the other power transmission lines shown with dotted lines are those of which the capacity is higher than 60,000 volts but lower than 110,000 volts. These principal lines are as follows:

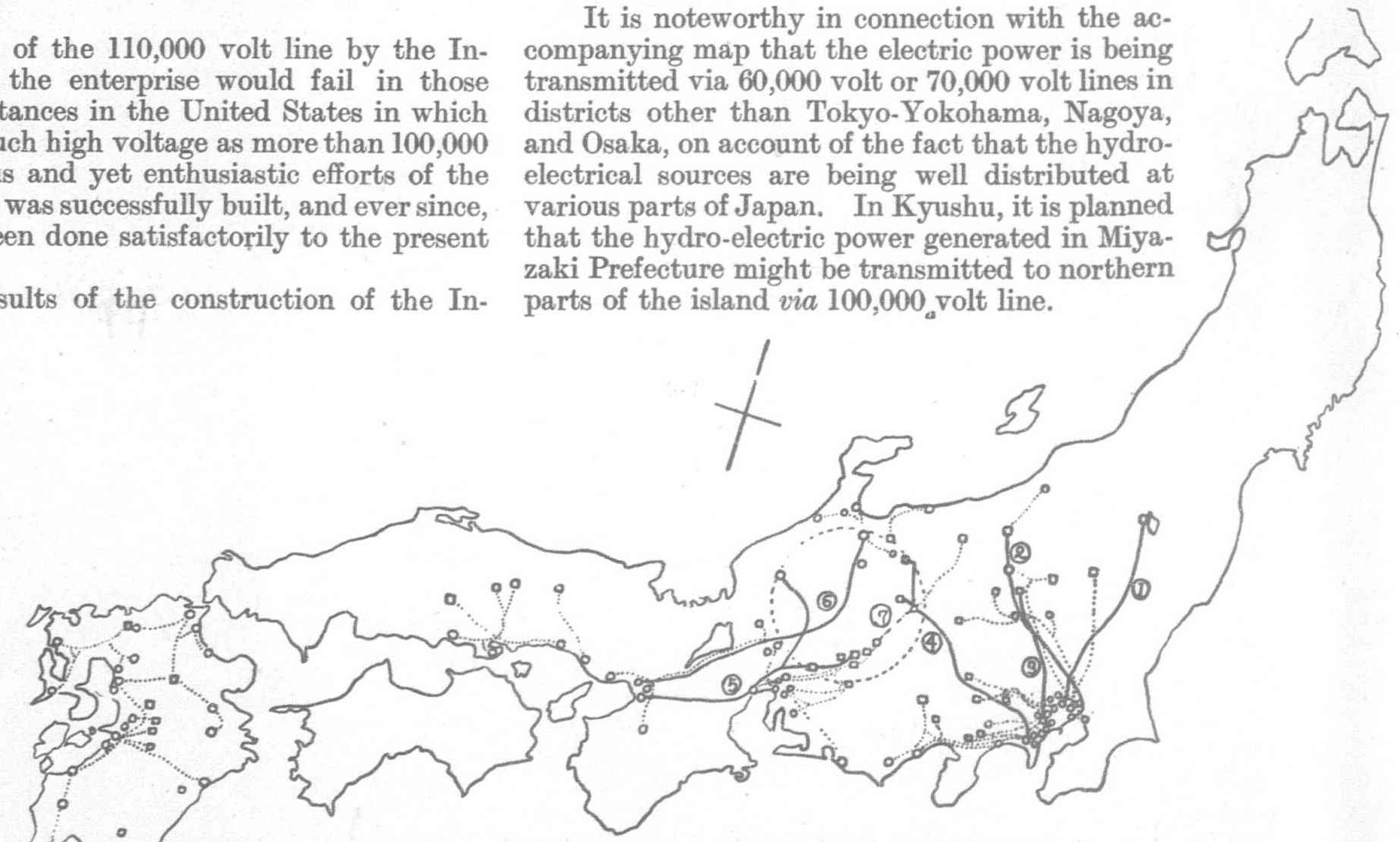
Principal Transmission Lines

	Name of Lines	Voltage	Cycle	Capacity (kw.)
1.	Inawashiro line of Tokyo Dento...	110,000	50	60,000
2.	Joetsu line of Tokyo Dento ...	154,000	50	65,000
3.	Gumma Denryoku line	110,000	50	16,000
4.	Keihin Denryoku line	154,000	50	77,000
5.	Daido Denryoku line	154,000	60	100,000
6.	Nihon Denryoku line	154,000	60	72,000
7.	Momoyama Connection line ...	77,000	50	22,000

Note: (*a*) The capacity of these power transmission lines, with exception of the Inawashiro line of the Tokyo Electric Light Company, is to be increased when the power plants now under construction (some of them having been completed) are finished.

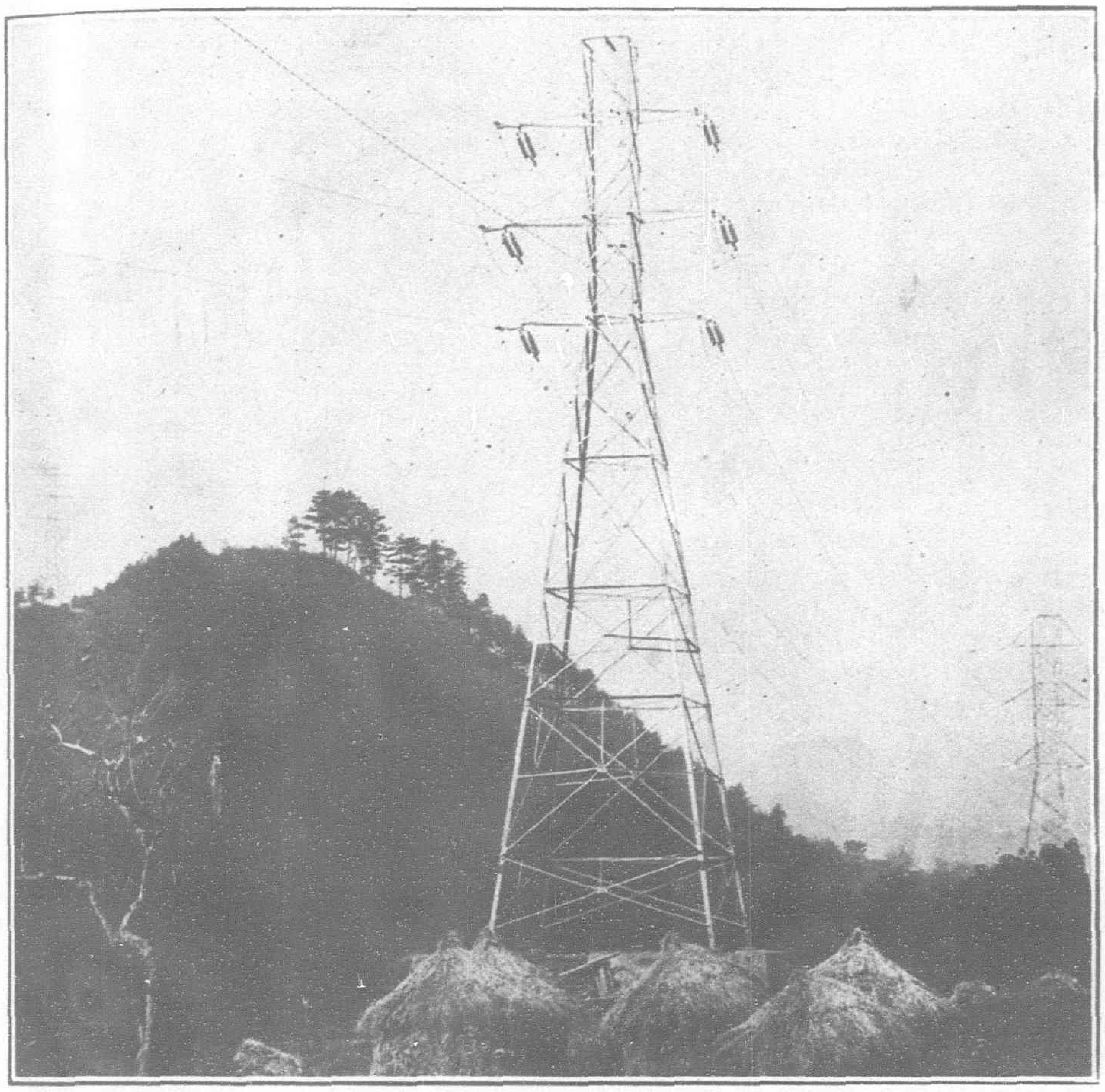
(*b*) The word Dento means electric light, and that Denryoku means electric power.

It is noteworthy in connection with the accompanying map that the electric power is being transmitted via 60,000 volt or 70,000 volt lines in districts other than Tokyo-Yokohama, Nagoya, and Osaka, on account of the fact that the hydro-electrical sources are being well distributed at various parts of Japan. In Kyushu, it is planned that the hydro-electric power generated in Miyazaki Prefecture might be transmitted to northern parts of the island *via* 100,000 volt line.



ELECTRIC POWER TRANSMISSION IN JAPAN

In this map are shown the electric power transmission lines, of which the voltage is 60,000 volts and upwards in dotted lines, and that 110,000 volts and unwards in the continued lines. The square stand for power plants, and small circles, for substatoins. The large circle in the centre shows the district where the hydro-electrical water sources are the richest throughout Japan. As regards the numbers of the continued lines, see the story.



One of the 154,000 volt transmission lines built by the Japan Electric Power Company. This line extends to 194 miles between Sasabu and Osaka. The picture was taken in Gifu Prefecture.

Unification of Cycle

As shown in the foregoing list of principal power transmission lines, the cycle of the lines going to the Tokyo-Yokohama districts is 50 while that going to Nagoya and Osaka is 60.

In the early stage of the development of the electrical enterprises in Japan, it was not even dreamed of that the power transmission connection between Tokyo and Osaka, a distance of approximately 300 miles, may ever be established. Consequently, the electric entrepreneurs in Tokyo districts adopted the 50 cycle system, which was the standard cycle in Europe, as they imported generators from Europe. While in Osaka, they adopted the American standard system of 60 cycles. The electrical enterprises in Kanto and Kansai (or the Tokyo districts and the Osaka districts, respectively) have developed independent of each other.

The recent development of the electrical enterprises in Japan, however, has resulted in the mutual approachment of the power transmission lines of the two groups, and eventually, the connection between the two has become a necessity, giving rise to the problem of the unification of the cycle. The power generating capacity of the 50 cycle clique, however, has totalled approximately 600,000-kw., while that of the other has also reached 800,000-kw. The total capacity of the motors furnished with the power by the electric power companies of the two cliques has also amounted to approximately 1,000,000 h.p., each, and therefore, the unification of the cycle costs a tremendous amount of money. Furthermore, the change of the cycle either to 50 or 60 may necessitate the suspension of the power supply temporarily, causing a heavy loss to the industry. In view of the foregoing difficulty, this question cannot be settled easily.

One of the hydro-electric power plants in the central parts of Japan, *i.e.*, in the Japan Alps districts, is designed in such a manner that it may be operated either at 50 or 60 cycles and it is equipped with the apparatus for changing the number of cycles whichever the way may be required so that the power generated may be switched on to Kanto or off to Kansai. It is the Momoyama power plant, which is connected with the Momoyama transmission line. By virtue of this system, the power transmission from Fukushima Prefecture in north-east to Hyogo Prefecture in south-west, a distance of approximately 500 miles, is being done.

Unification of Voltage

The unification of the voltage, together with the unification of the number of cycles, is one of the most important problems in connection with the proposed establishment of the power transmission line network. This problem has been studied for more than 10 years, and thanks to the untiring efforts of the Government, it has been realized to some extent.

To begin with, the distribution of power for the electric lights and domestic electrical utensils is being done at 100 volts, and that for electrically driven motors, 200 volts, while the distribution at high voltage is being standardized at 3,300 volts. (At the receiving end, 3,000 volts).

As for the special high pressure power transmission, it is often found disadvantageous to limit the transmission of power within a very few variety of voltage, and therefore, the following voltages are in practice: 11,000 v., 22,000 v., 33,000 v., 44,000 v., 55,000 v., 66,000 v., 77,000 v., and the voltage at the receiving end is lower by about 10 per cent.

According to a recent investigation, the length of the transmission lines of which the capacity is higher than 50,000 volts, is as follows:

55,000 v. ...	692 miles	1,110 kilometres
66,000 ,, ...	2,152 ,,	3,450 ,,
77,000 ,, ...	662 ,,	1,060 ,,

The foregoing voltages are standardized according to each district; for instance, in and around Tokyo, Kyushu island, and Hokkaido, 66,000 volt lines are in use, while in the Nagoya districts and the Hiroshima districts, 77,000 volts and 50,000 volt lines are in use, respectively.

As regards the lines of which the capacity is higher than 100,000 lines, it was limited to only two kinds of voltages, at 110,000 volts and 154,000 volts, respectively, as the result of conference between the Government authorities and the engineers who planned the power transmission between the Japan Alps districts to Kanto and Kansai. This limitation of voltage was in consideration of the fact that if various kinds of lines were allowed to be constructed, the connection between these lines of different voltages results in a considerable amount of waste of power. The 110,000 volt line, at present, extends to 224 miles or 360 kilometres, and the 154,000 volt lines, 604 miles, or 975 kilometres.

Experts in the electric power transmission are now investigating at what voltage the lines should be standardized in the future when still greater quantity of power is to be transmitted. It is proposed to built 220,000 volt line, but the question is regarded as doubtful whether it is advantageous for Japan in consideration of the distance between the power plants and the districts where the power is actually consumed.

As for future proposals, such as the construction of more transmission lines, development of more water sources, and creation of reservoir and steam power plants in preparation for low water periods, definite plans will be published in the near future.

Radio Service to Hongkong

Radio Corp. of America has inaugurated a new radio service between the United States and Hongkong, China, *via* San Francisco. Messages from San Francisco and the bay cities are accepted, at the regular rate of 75 cents a word with a deferred rate of 37½ cents. The ordinary and deferred rates from New York are 90 cents and 45 cents respectively. The rates of this new service represent a 10 per cent. reduction over all existing rates between the points covered.

Broadcasting in Japan

M. So and H. U. Pearce, Tokyo Electric Company

WITHIN a short time after broadcasting was started in the United States, crystal receiving sets were in use in Japan, but although during the first four or five years after the introduction of broadcasting in America the progress in that country was extremely rapid, during this same period progress in Japan was extremely slow. On March 22, 1925, however, shortly after the government ban was lifted, a temporary broadcasting station JOAK, wavelength 375 meters, was established at Tokyo, and from that time the progress of radio broadcasting in Japan has been exceedingly rapid.

The first station was originated and installed by a group of leading men from many different industries—newspapermen, merchants, electrical manufacturers, central station men and government officials. Shortly after the station at Tokyo started, station JOBK at Osaka started broadcasting with a 385 meter wavelength, and later station JOCK at Nagoya with 360 meter wavelength.

A Typical Group of Radio Artists

These stations collect a fee of one Yen per month from all owners of receiving sets and a fee of one Yen a year must be paid to the Government Department of Communications. At the present time there are approximately 230,000 subscribers to the Tokyo station, 80,000 to that in Osaka and 40,000 to the Nagoya station.

Those in control of the above broadcasting stations have recently combined and formed the Nippon Hoso Kyokwai (Japan Broadcasting Association) and are planning to increase the existing stations from 1 kw. to 10 kw. in the near future, and also to establish small stations in Hiroshima, Kumamoto, Sendai, Sapporo in the North Island, Kanazawa, Nagano and Hamamatsu. These stations will all be inter-connected so that programs from the larger stations can be relayed by the smaller stations and all districts can either obtain the benefits of the better programs supplied by the larger stations or broadcast their own programs.

The broadcasting time of JOAK is divided roughly into these three general classes: Economics 25 per cent. of the total time; Educational, 40 per cent. and entertainment, 35 per cent. Under economics are market reports, news, time and weather reports. Educational includes lectures, general lectures, and language lessons. Entertainment consists of Japanese music and foreign music.

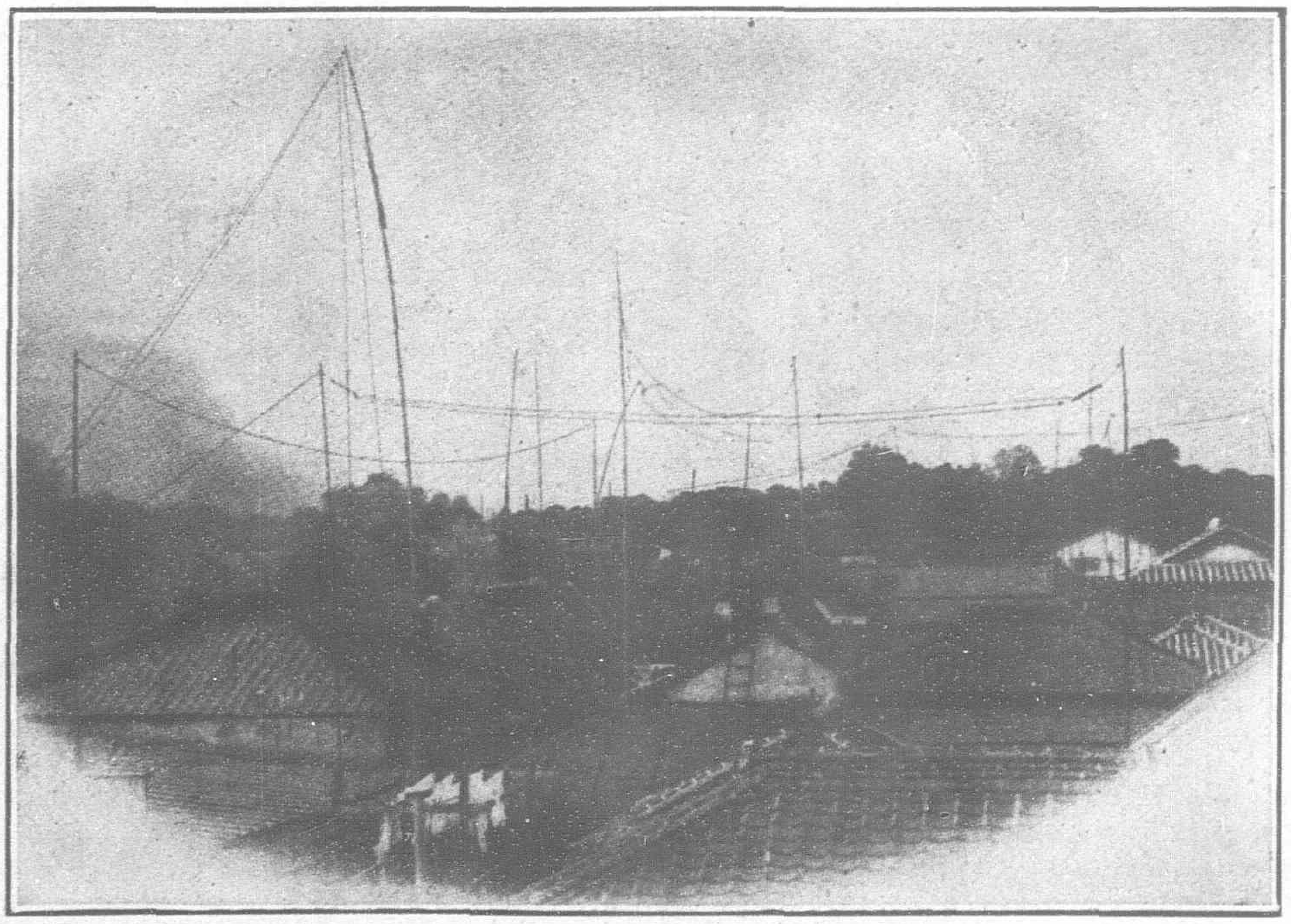
The following is a typical program from the JOAK broadcasting station: Morning—9.00 weather report for Tokyo; 9:05 Share reports; 9:30 Share reports, 9:45 Daily menu; 10:00 Market reports; 10:30 Share reports; 10:45 Home course; 11:30 Time report; 11:40 Share reports; 11:55 Share reports. Afternoon—12:10 Music; 12:45 News events by the Newspaper "*Miyako Shimbun*;" 1:45 Women's course; 2:30 Share reports; 2:45 Provincial weather report; 3:30 Share reports, etc. Evening—6:00 Story for children; 6:30 English course; 7:10 News events by the newspaper "*Nippon Dempo*;" 7:25 Lecture; 7:45 Soprano and violin solos by Mise Tsuruyo Takoeka, soprano; Mr. Chusuke Ta, violinist, and Mr. Nao Kashiwabara, piano accompanist, and 9:30 Time report and weather report.

With the beginning of broadcasting, a large number of small manufacturers started to put sets of all descriptions on the market and large stocks of foreign manufacturers were shipped to Japan, causing the market to become flooded which, in a short time, caused a decided slump in the radio business. Each of the imported apparatus which may have been staisfactory in the home countries was entirely unsatisfactory in Japan.

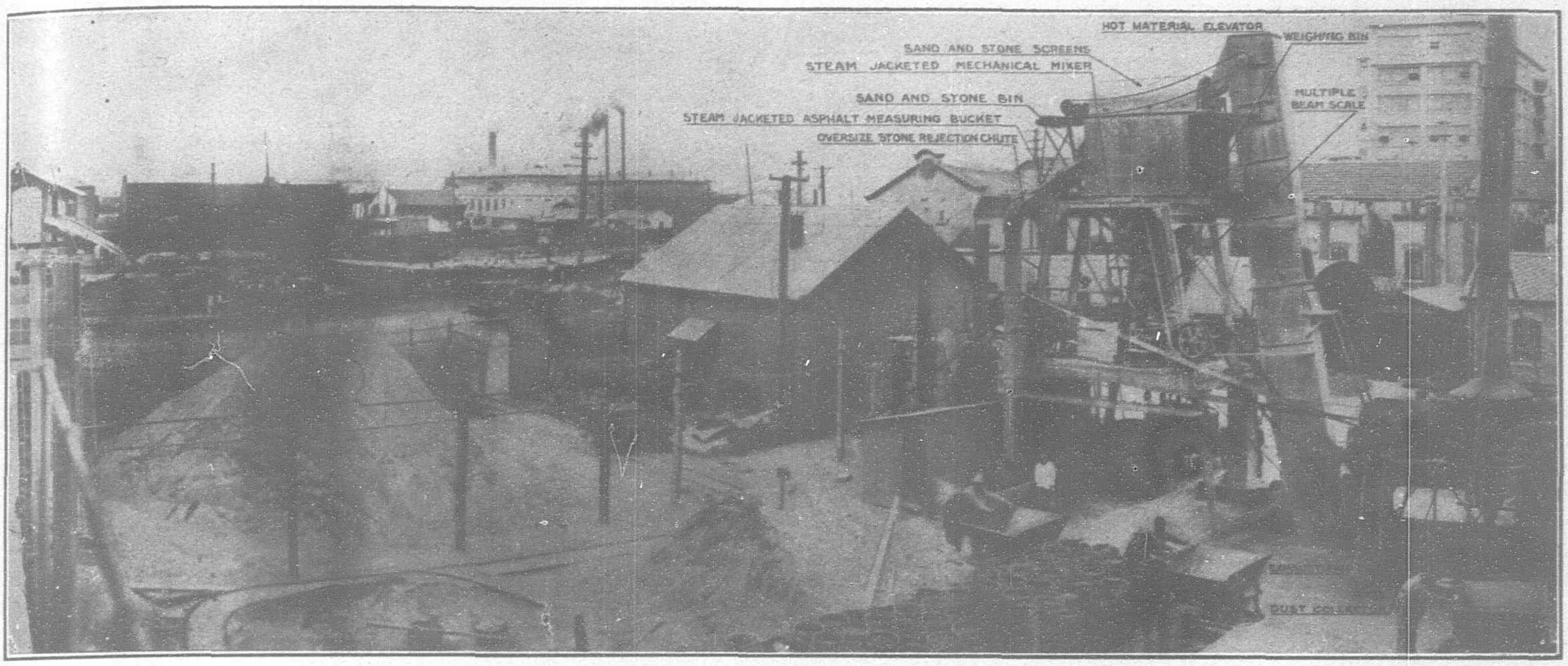
The products of the local manufacturers have shown a gradual improvement and a marked difference is seen in the quality of the present product and that of a year ago. As an indication of the interest in radio in Japan, during the first seven months of the year over 1,300 patent applications were made, and 1,400 models submitted.

From June to July, 1926, radio apparatus valued at Yen 1,966,700 has been

(Continued on page 553).]



A Glance Over the Roofs of Japan will Show Whether Radio is Popular


HOT MATERIAL ELEVATOR
WEIGHING BIN
SAND AND STONE SCREENS
STEAM JACKETED MECHANICAL MIXER
SAND AND STONE BIN
MULTIPLE BEAM SCALE
STEAM JACKETED ASPHALT MEASURING BUCKET
OVERSIZE STONE REJECTION CHUTE

Panorama of the Warren-Equipped Asphalt Plant at Sinza Road

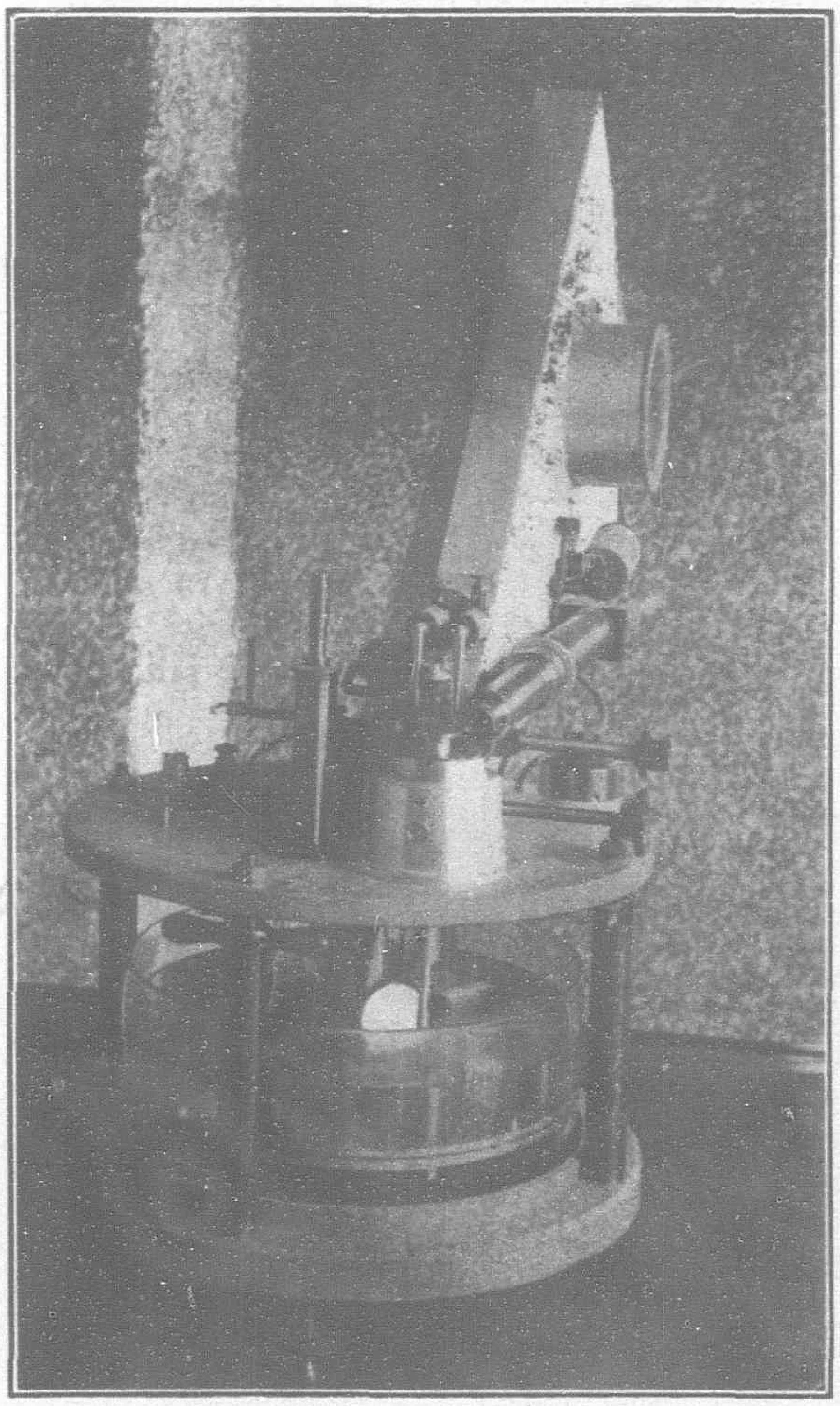
Shanghai's Three Asphalt Plants

By H. F. Wilkins

FAR out in the industrial districts of Shanghai and away from the crowded business section are three modern asphalt plants where the surfaces for Shanghai streets are made. They are part and parcel of the Public Works Department of the Shanghai Municipal Council, yet in their rather obscure locations they seem to be as far from public attention as if they were operating in another city.

Few people outside those intimately connected with local road building know that the Shanghai Municipal Council has these three plants, where scientific methods of road construction somewhat in advance of anything of their kind in America or Europe are put to practical application on some of the most complex problems ever faced by any city with paved streets.

Few people know that important practical laboratory work has been under way for the last ten years in the development of Shanghai street surfaces, and that as a result of these tests a new kind of hardening medium or "filler" has been found for asphaltic road surfaces that has proved a substitute for Portland cement. This new substance is a certain kind of crushed volcanic rock which comes from a quarry in Honan Province. Laboratory tests of the most exhaustive kind, together with practical tests on Shanghai streets, have proved that this new filler makes a more efficient job on Shanghai street surfacing than does Portland cement. When it is realized that Portland cement has been held for years by the world's most advanced asphalt experts as the best possible filler to be used in making sheet asphalt pavement for heavy traffic, then the importance of this discovery draws attention. Also to be considered is the fact that the crushed stone is much cheaper than Portland cement.



The Electrically Controlled Pentrometer

Shanghai's Street Problems

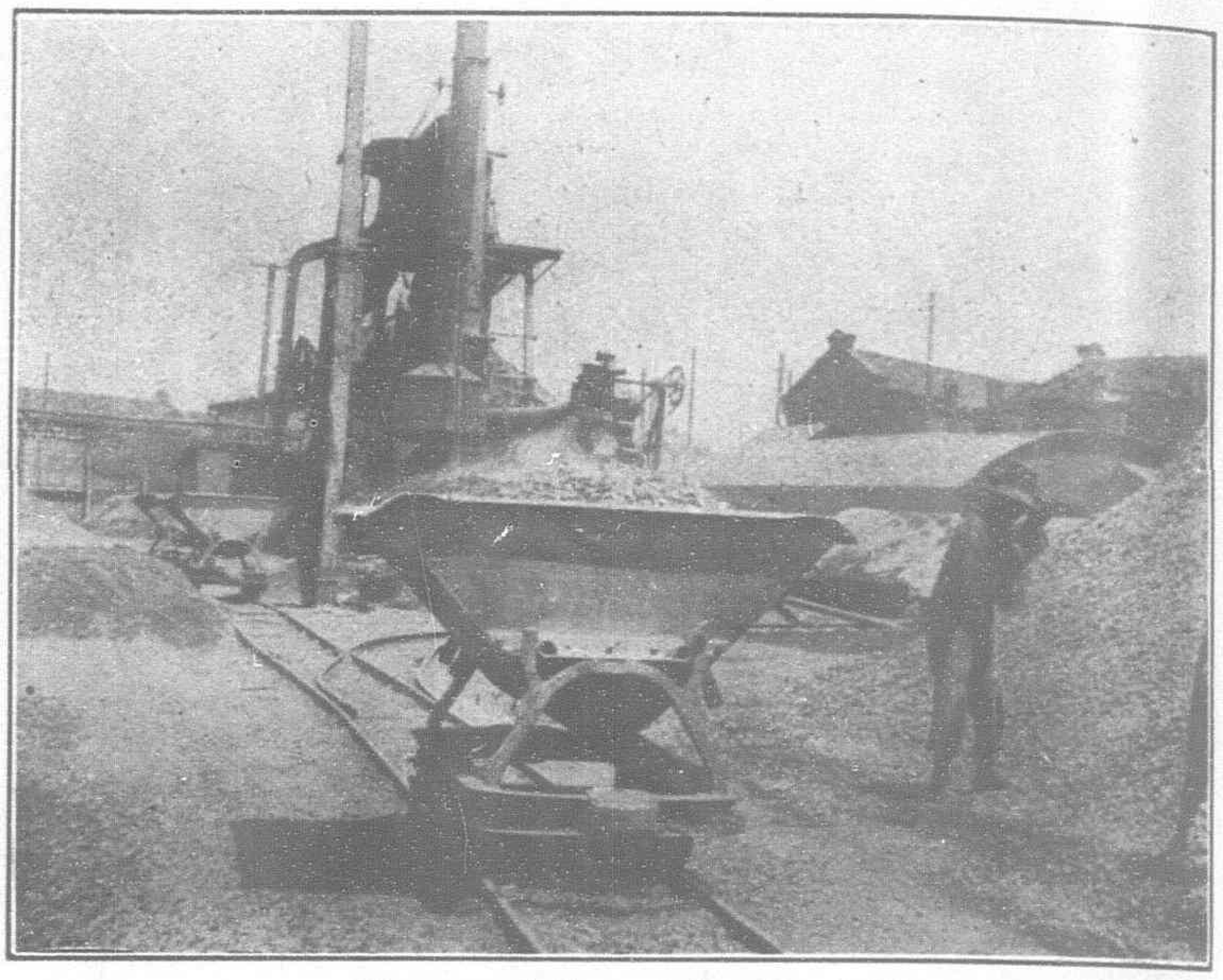
Necessity is supposed to have given birth to invention, and the old saying seems to run true to form in the case in point. When engineers began to apply modern methods to the paving of Shanghai streets they ran into such a nest of problems that invention became a necessity. Some of these problems had to be overcome by methods never before tried.

The concentration called for in the solution of these complex problems led to the adoption of methods of research and experiment that have produced the results mentioned above, mainly the discovery of this new kind of filler. These problems themselves are worthy of some attention, in the light of all the study they caused and the research that was applied to overcome them.

In the first place, the subsoil under Shanghai streets is particularly unstable and unadaptable as a foundation for road work. The city is built over a deep layer of alluvial deposit, thoroughly saturated with water. The tide rises daily through this subsoil to the very base of the street foundations. A hole dug anywhere below this level fills at high tide. Such a subsoil calls for a massive, hand packed foundation, 12 inches thick, composed of large blocks of stone, hand laid and consolidated by ramming and rolling. On top of this is a consolidated layer, 2 inches thick of broken stone. Local conditions, in a word, call for massiveness and rigidity rarely needed in other localities.

Another great problem is the seasonal range of temperature. Shanghai roads must stand a range of 130 degrees from the coldest winter days to the excessive heat of late summer. Except at

"Screeding" A Newly-Laid Surface



Transportation at the No. 2 Plant

very low temperatures, asphalt is always in a more or less plastic condition. Unless the mineral aggregate in the mixture is composed of very fine particles, their realtive position is constantly changing, especially under the kneeding action of traffic in hot weather. A fine balance and a careful selection of ingredients therefore has to be supplied to meet local conditions.

Shanghai traffic offers another problem that almost no other city in the world has to cope with, for there is more variety of traffic on Shanghai streets than in any city of America or Europe. It runs the gamut of wheeled vehicles from wheelbarrows (a Chinese wheelbarrow is one of the most ruinous contraptions conceivable in its action on asphalt) to iron-tired hand carts, heavy buses and trucks, and fast and heavy pneumatic-tired motor traffic.

The fourth big problem in Shanghai road construction is one that would be encountered in almost any city in the Orient, the labor problem. Low efficiency goes with low pay, and while the pay is negligible per man hired the number of men required calls for an unusual amount of attention to their management.

The problem in general, as applied to the selection of the kind of asphalt to be used in Shanghai street construction, was stated in an article written by a member of the Public Works Department which appeared last July in the *North-China Daily News*. This was the problem :

"To select an asphalt which has a high tensile strength at low temperatures and consequently has a fairly low fusing point, and to devise means of hardening this asphalt without oxidation or the sacrifice of essential characteristics, and of combining the hardened asphalt with a definitely proportioned mixture of very fine sand."

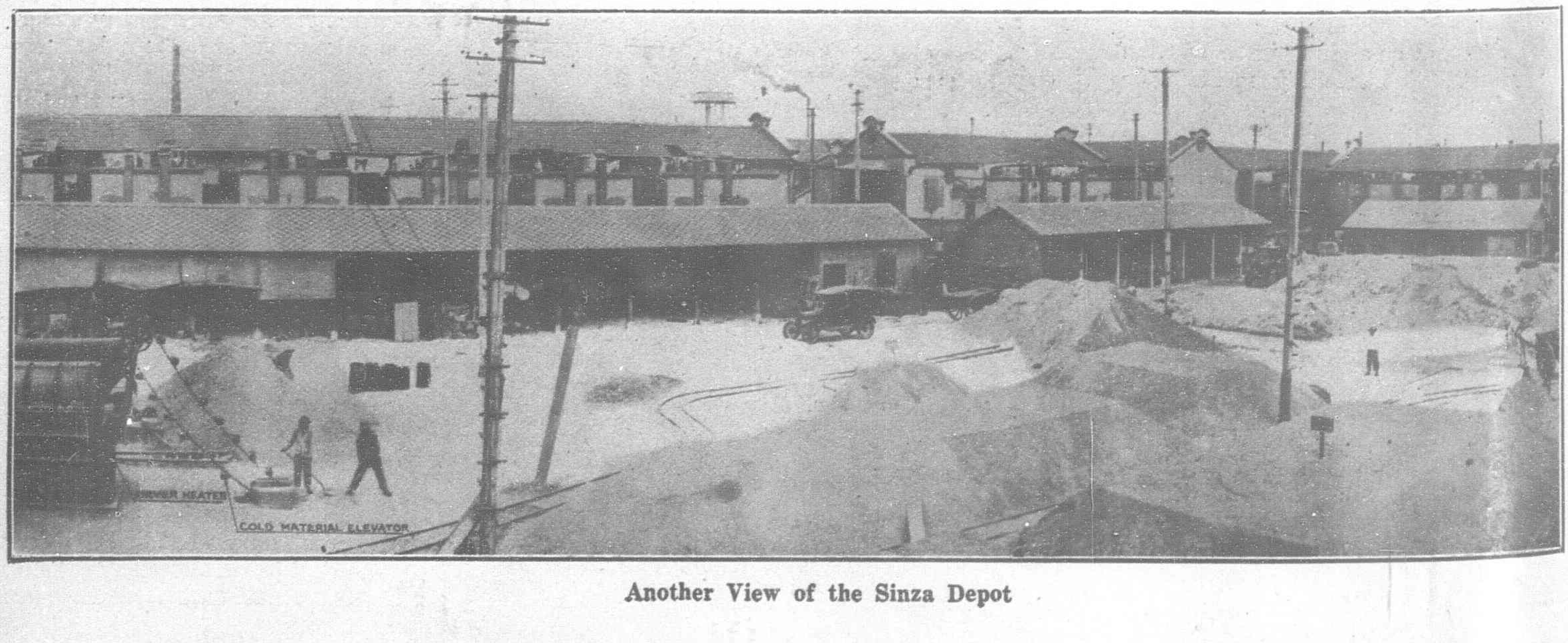
Now Shanghai is the first city where improved road surfacing developed out of the solution to this problem stated above has ever been used. The asphalt used by the Public Works Department is known as oil-asphalt, which is a by-product of asphaltic-base crude oil. The asphalt itself is merely an ingredient of the finished road surface of course. It is purchased from foreign refining companies in barrels. The Public Works Department of Shanghai uses about 20,000 barrels of it a year, or some 4,000 tons. This year there will be only about 2,000 tons of it used, however. The department uses mainly three different kinds, Californian oil-asphalt, Mexican oil-asphalt and Trinidad Natural Asphalt Cement.

The production of this oil-asphalt is very carefully controlled by the manufacturers, who employ highly skilled chemists to test the product in various stages of refining and hardening before it is put on the market.

"It is thus possible," stated this article previously referred to, "for the consumer to order asphalts for road construction which have fusing points from 106 degrees Fahrenheit to 294 degrees. The solution to the problem would be simple if it were possible locally to use an asphalt with a high fusing point. But this is not possible, for the ductility of any asphalt has been found to vary inversely as the fusing point, hence an oil-asphalt which might be hard enough to withstand the summer heat could not stand the cold weather. It would crack."

Where Local Science Comes In

There was the main problem, then. Shanghai has such a great range of temperature that any known paving formula produced



Another View of the Sinza Depot

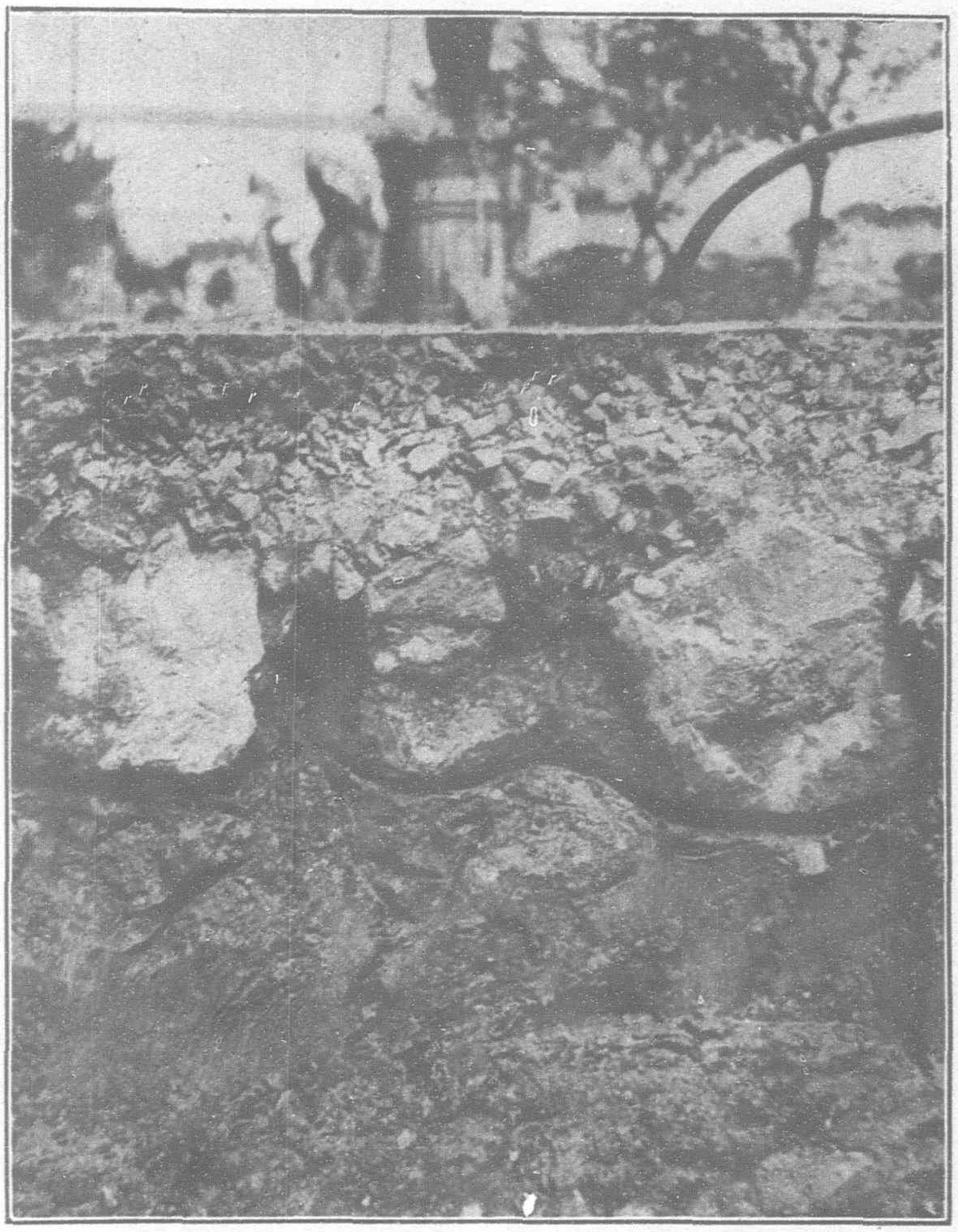
something that either melted and got pushed into ruts and ridges in the summer or cracked in winter. Working from this main point toward a solution, practical laboratory science was called into play. A small laboratory was set up in a building at the concrete-ware yard. That was nearly ten years ago. Some idea of the vast number of incidental problems into which the research carried can be had from the fact that no less than 4,348 physical and chemical tests were carried out on asphalts and filler mixtures from 1923 to the end of the first five months of this year.

It is a well-known fact that the addition to asphalts of Portland cement or pulverized lime has a hardening effect on the mixture of sand and asphalt, and these two substances have been used for fillers by the manufacturers of asphaltic paving since it was first invented. Before experiments were started in Shanghai, the idea prevailed in some quarters that the filler entered into some sort of chemical combination with the asphalt. This old precept was questioned at the start of the new research here. The Public Works Department designed and had manufactured locally a machine called an electric extractor still. A photograph of it accompanies this article. With this machine it was possible to recover by means of centrifugal action and solvents, the separate ingredients of a sample of asphaltic concrete. It was found that absolutely no chemical change had taken place in the filler. Its action on and combination with the asphalt had been purely mechanical. There was one old theory exploded.

The Portland Cement Fetish

Then came the question of the best kind of filler to use. Apparently nobody had tried before to depart from accepted excellence found in either limestone or Portland cement as a filler. Experiments were tried with various kinds of pulverized minerals that could be obtained near Shanghai, or close enough to make shipping inexpensive. These samples were combined with asphalt in varying proportions and tests carried out on the combinations that resulted.

It was found that the use of these fillers resulted in



Cross Section of a Shanghai Street Foundation

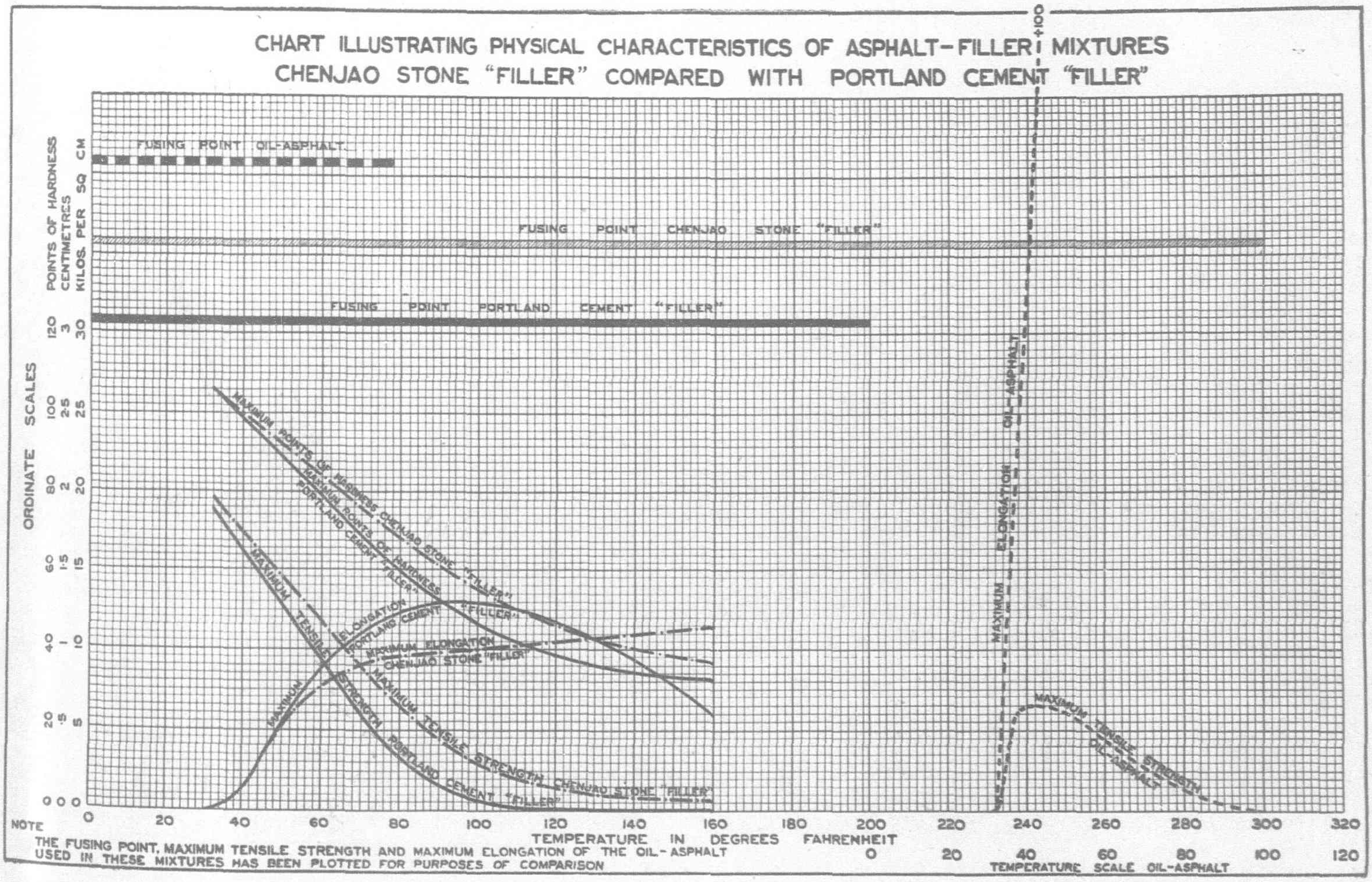
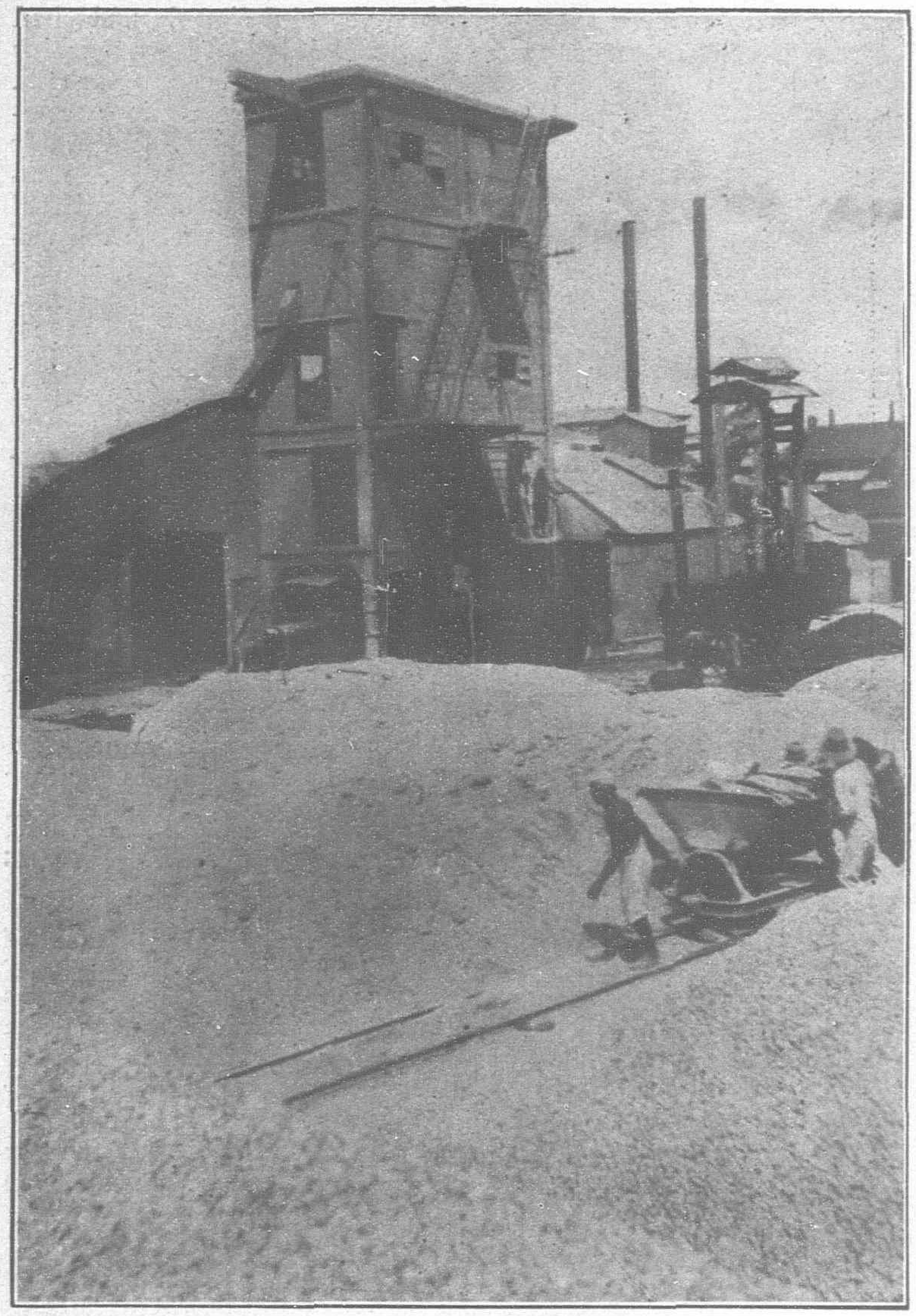
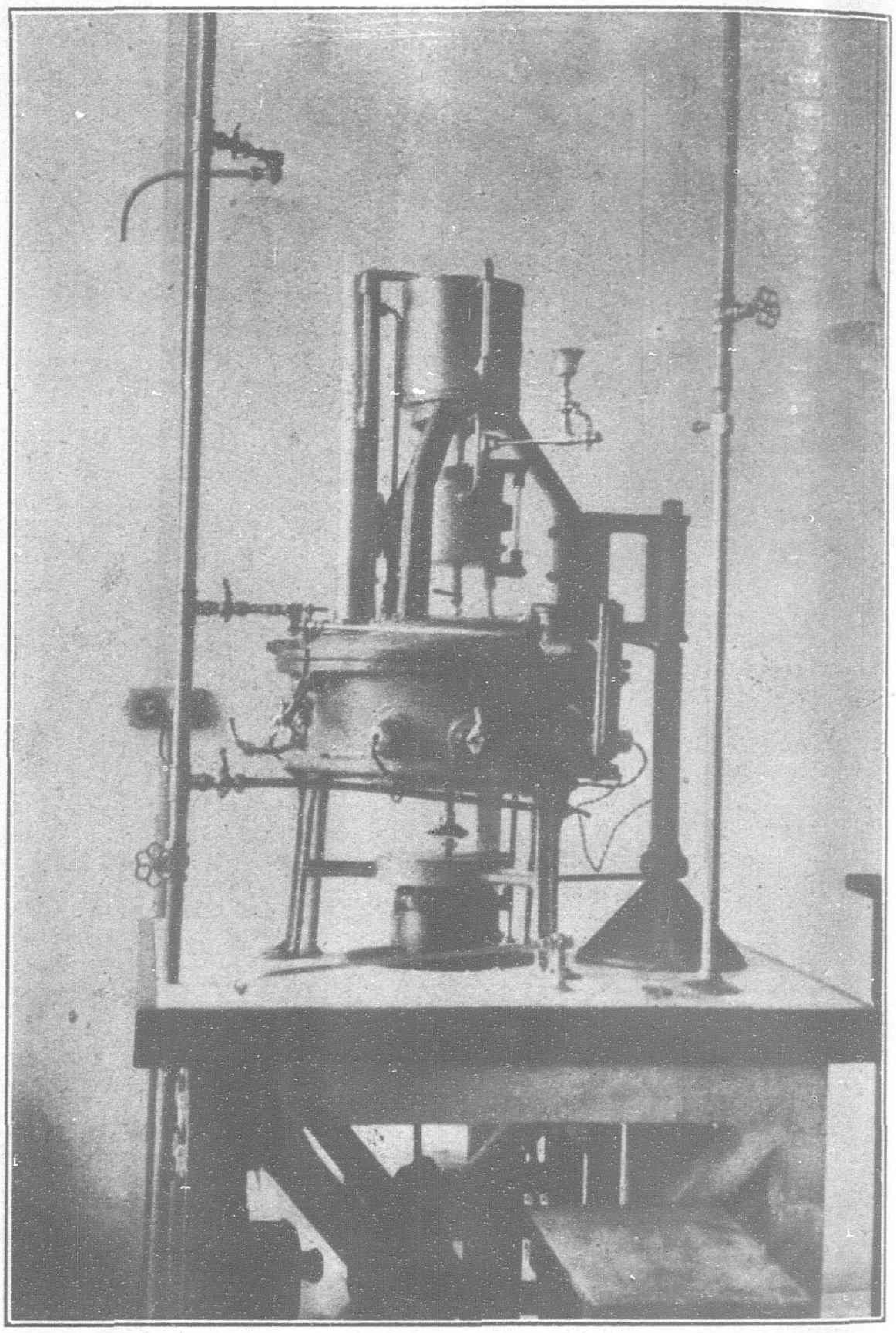


CHART ILLUSTRATING PHYSICAL CHARACTERISTICS OF ASPHALT-FILLER MIXTURES
CHENJAO STONE "FILLER" COMPARED WITH PORTLAND CEMENT "FILLER"

NOTE
THE FUSING POINT, MAXIMUM TENSILE STRENGTH AND MAXIMUM ELONGATION OF THE OIL-ASPHALT USED IN THESE MIXTURES HAS BEEN PLOTTED FOR PURPOSES OF COMPARISON



No. 1. Assembled Composite



Electric Extractor Still

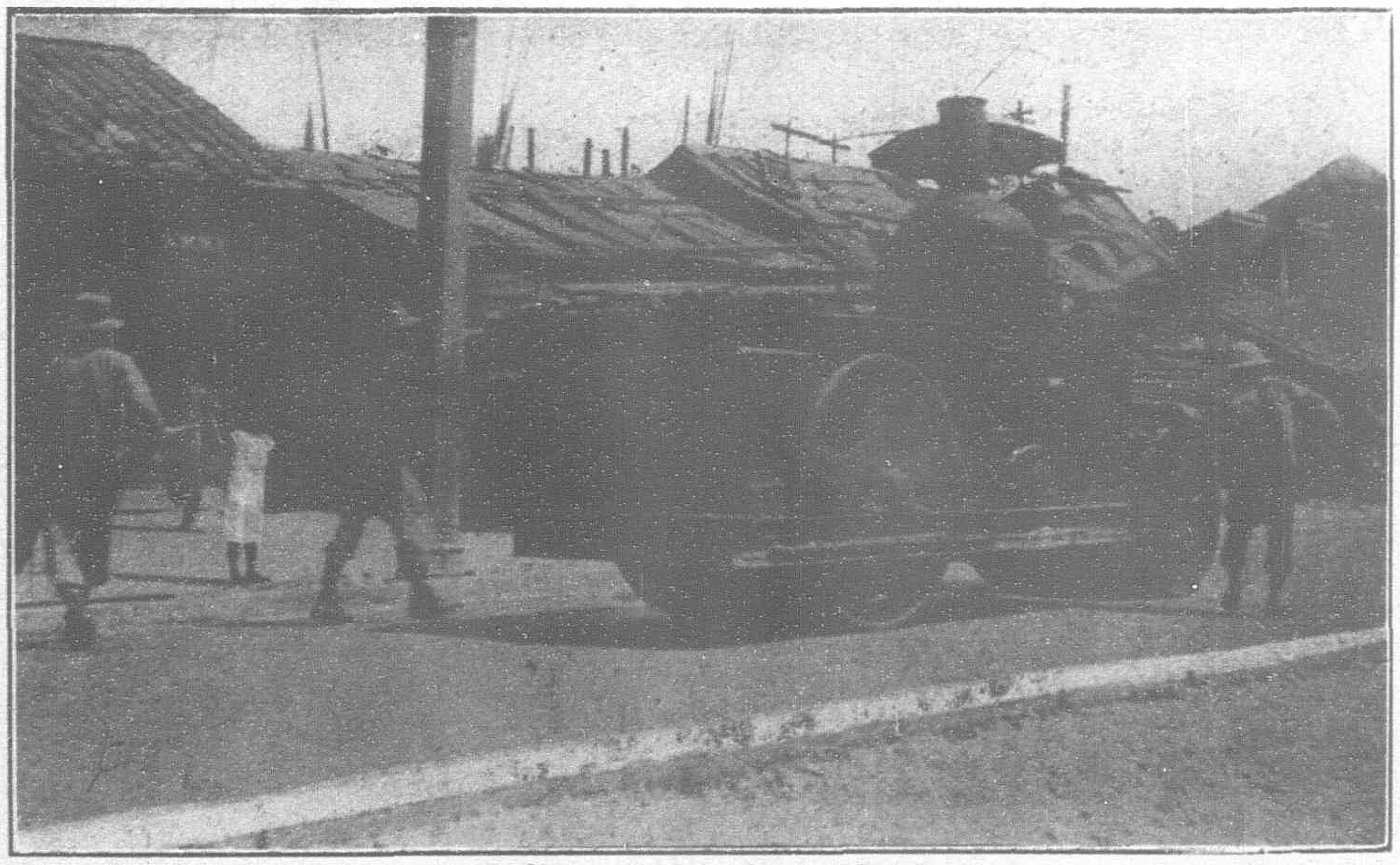
products with distinctly new characteristics of tensile strength, hardness and fusing points. Thirty-four different mineral fillers have been tested in the laboratory and on the road, Portland cement being taken as the standard for purposes of comparison. From a study of results it was evident that a special kind of pulverized stone was far superior to Portland cement as a filler, and in fact superior to any other filler tested. Accompanying diagrams show the charted results of some of these tests with the new filler.

"The fineness of the particles and the property of adsorption," said the *North-China Daily News* article, "have an important bearing on the success of a filler, though to what extent has not been fully determined. As the property of adsorption has a bearing on the thickness of the film of asphalt which can adhere to any surface of any particle, it is evident that relatively enormous and varying quantities of asphalt can be adsorbed or held on the surface of these fine particles in the mixture."

Field Experiments

When experiments had determined satisfactory ratios for the combination of filler and asphalt, the mixtures were made according to formula in the asphalt plants and tried out on Shanghai streets. In 1925 and 1926 these mixtures were laid on the following roads: Thibet Road, south of Soochow Road; Thibet Road at the junction with East Burkill Road; East Seward Road, west of Fearon; Yangtszepoo Road, west of Macgregor Road; and Paoting Road south of Kwenming. None of these sections have so far shown any indication of failure.

Another series of tests was conducted to arrive at the definite scientific reason for peculiar properties shown by certain fillers in comparison with certain others. In further experiments with some specially selected pure inorganic elements and their compounds it is hoped within a year or so to definitely lay down the



Rolling A New Street Surface

chemical composition of the ideal filler to suit any given conditions.

Another invention of the Public Works Department that contributed materially to the success of these and other experiments is the electrically controlled pentrometer. This machine measures the hardness or penetration of pure asphalts. It has proved invaluable in determining selection of materials used and the ratio of their combination. A photograph of this machine is also reproduced here.

On continuing with the field experiments it was found that the improved grading curves or graphic ratios of these mixtures bore a definite relation to each other, and it has been found possible to formulate a definite rule for this combination ratio. That is to say, the proportioning of road surface materials has been worked down to so fine a point that, given ingredients and road conditions, the Public Works Department here in Shanghai could recommend the mixture to be used on any street. This is explained further in the article referred to before :

"The asphalt filler ratio, it was discovered, existed in sheet asphalt mixtures in the same manner and was of equal importance with the water-cement ratio that has been determined in the use of Portland cement concrete.

"This improved sheet asphalt will be developed further still when it is possible to obtain in large quantities a sand of such fineness that none of its particles exceeds 1/40th of an inch in diameter. It will be evident that, provided practical difficulties of heating and mixing can be overcome, the heavy road surface of the future will consist of an intimate mixture of specially-selected and finely pulverized minerals and asphalt."

Successful Methods of Application

Asphaltic concrete, which is a mixture of graded broken stone sand filler, and asphalt, is still being used on light traffic streets and as a binder course or foundation, on the sheet asphalt roads in the heavy traffic sections.

The seal coat of pure asphalt, which usually is applied to this kind of road and which precedence dictated here, was found to "bleed" excessively in the very hot weather ; that is, it became sticky and soft. This objection to the usual road surface was overcome by further experimenting and application. The paint coat is omitted by the new method and the surface of the asphaltic concrete, while still hot, is "blinded," or lightly dusted over with improved sheet asphalt, then rolled in the usual way. The finished thickness of the sheet asphalt so applied is about 1/8th of an inch, and the cost per 100 super feet works out about Taels 24, as compared to Taels 25 where the pure asphalt is applied as paint and then dusted down with sand.

Sections of asphaltic concrete surfaced with improved sheet asphalt in the manner just described were laid last year on Bubbling Well Road, from Medhurst Road to west of Gordon Road, from Seymour Road to Ferry Road, from east of Hardoon Road to Hart Road, and on Chaoufoong Road from Broadway east to the Whangpoo River.

These sections are perfectly dry and hard even on the hottest day of midsummer under a scorching Shanghai sun.

The Asphaltic Concrete Plants

The physical characteristics of these three asphalt plants where Shanghai street paving is turned out are extremely modern. The plants consist of modern equipment in modern arrangement supplied with modern and convenient handling methods.

The first plant was built in 1917 at what is called the Sinza Depot, out along Soochow Creek, where raw materials can be dumped right at the back door from lighters and barges and shifted into the heart of the plant for storage in hand-operated dump cars on rails. The second plant was built in this same place in 1922, and the third plant, at what is called Pingliang Piece, is some distance to the east of Sinza Depot. The locations were chosen with a view to easy distribution, both at present and in future.

The No. 2 and 3 plants at the Sinza depot and Pingliang Piece are entirely equipped with Warren materials and by Warren specifications, and are thoroughly modern in every way. They include combined dryers and heaters, cold and hot material elevators, a steam jacketed mechanical mixers, a Fairbanks Morse suspended beam scales, a rotary screen with 1/8-inch, 1/2-inch and 1-inch perforations, motors, boilers and all necessary equipment. A Ray Oil Burning System has been installed under the boilers and dryers to take the place of coal, and is working satisfactorily.

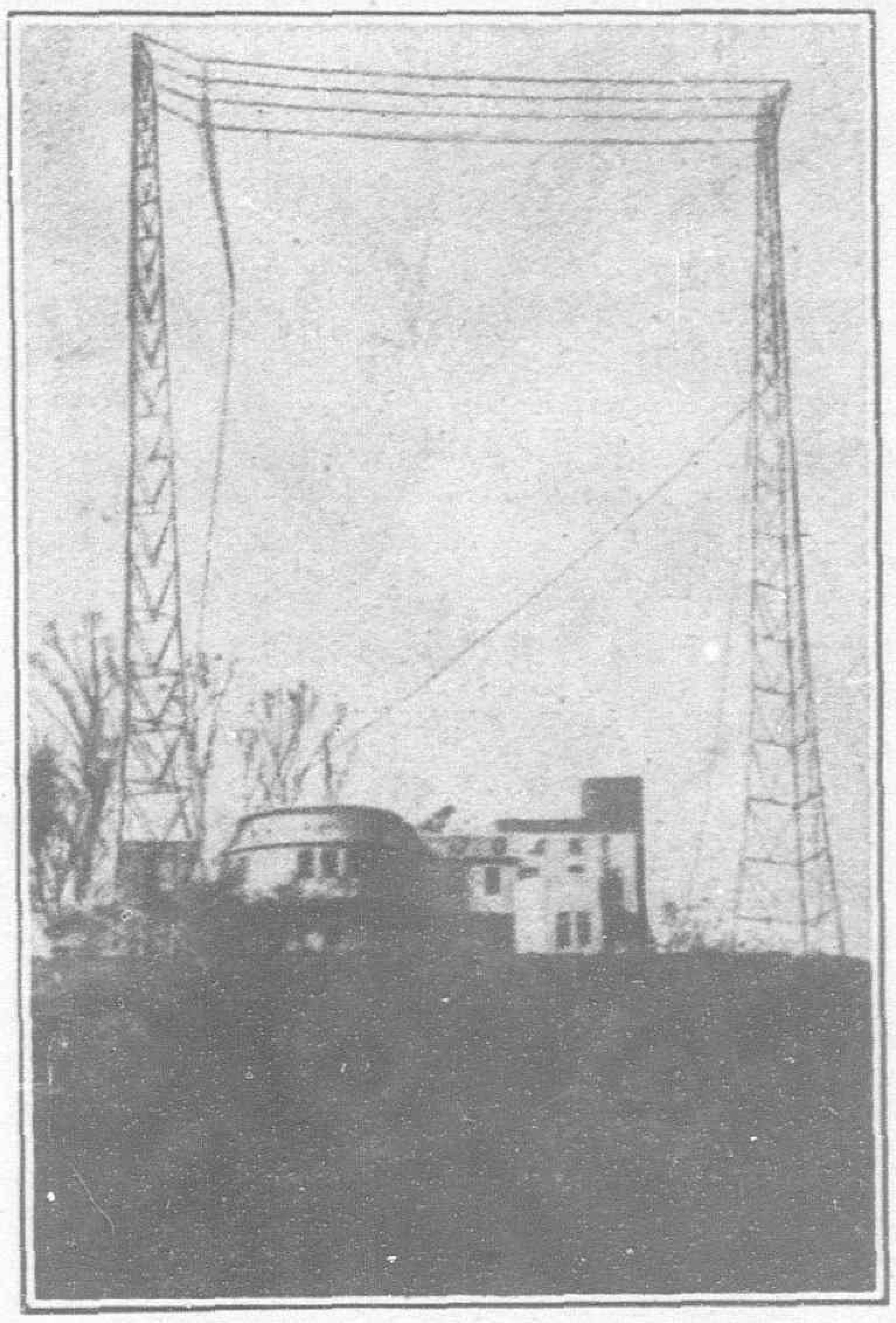
The aggregate, stone and sand, is shot up through the cold material elevator, on a bucket conveyor to the dryer and heater, Here it is turned and baked and finally finds its way to the hot material elevator which preserves its temperature and carries it up to the sand and stone screens.

It passes then to the hot material storage bins, where constant temperature is kept. The asphalt flows in through pipes from the steam heated kettles is measured carefully, and finds its way in the proper proportion to the mechanical hot mixer, where the desired mix is concocted. It is dumped through the discharge gate from this mixer directly into trucks as it is needed for use, and carted off to its destination.

The Public Works Department Road Materials Testing laboratory is located at the Sinza Depot, in a building of its own. A Foreign Inspector is on the job there all the time, to run the plants and continually tests the ingredients and finished product.

Broadcasting in Japan

(Continued from page 548).

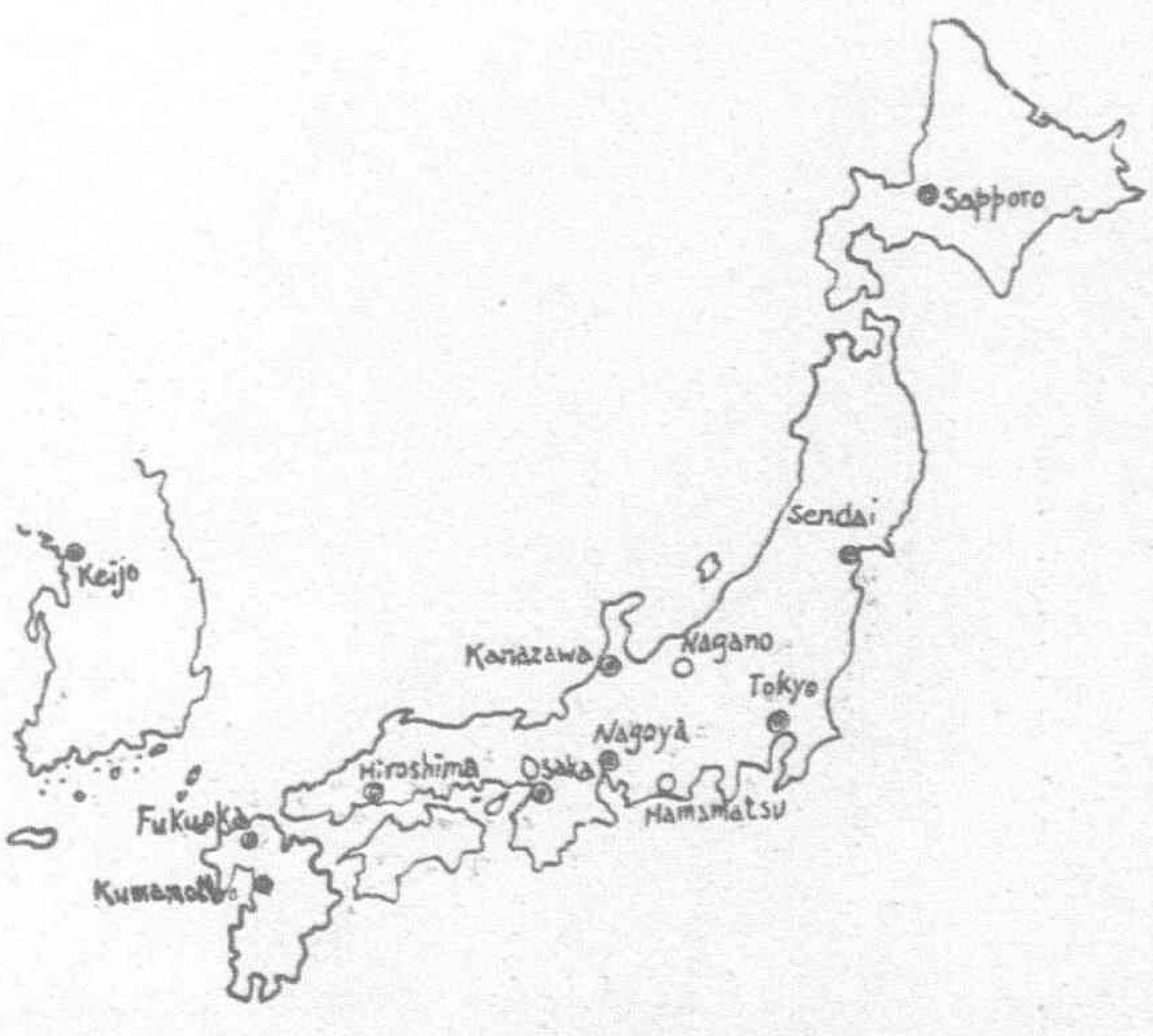


Station JOAK in Tokyo

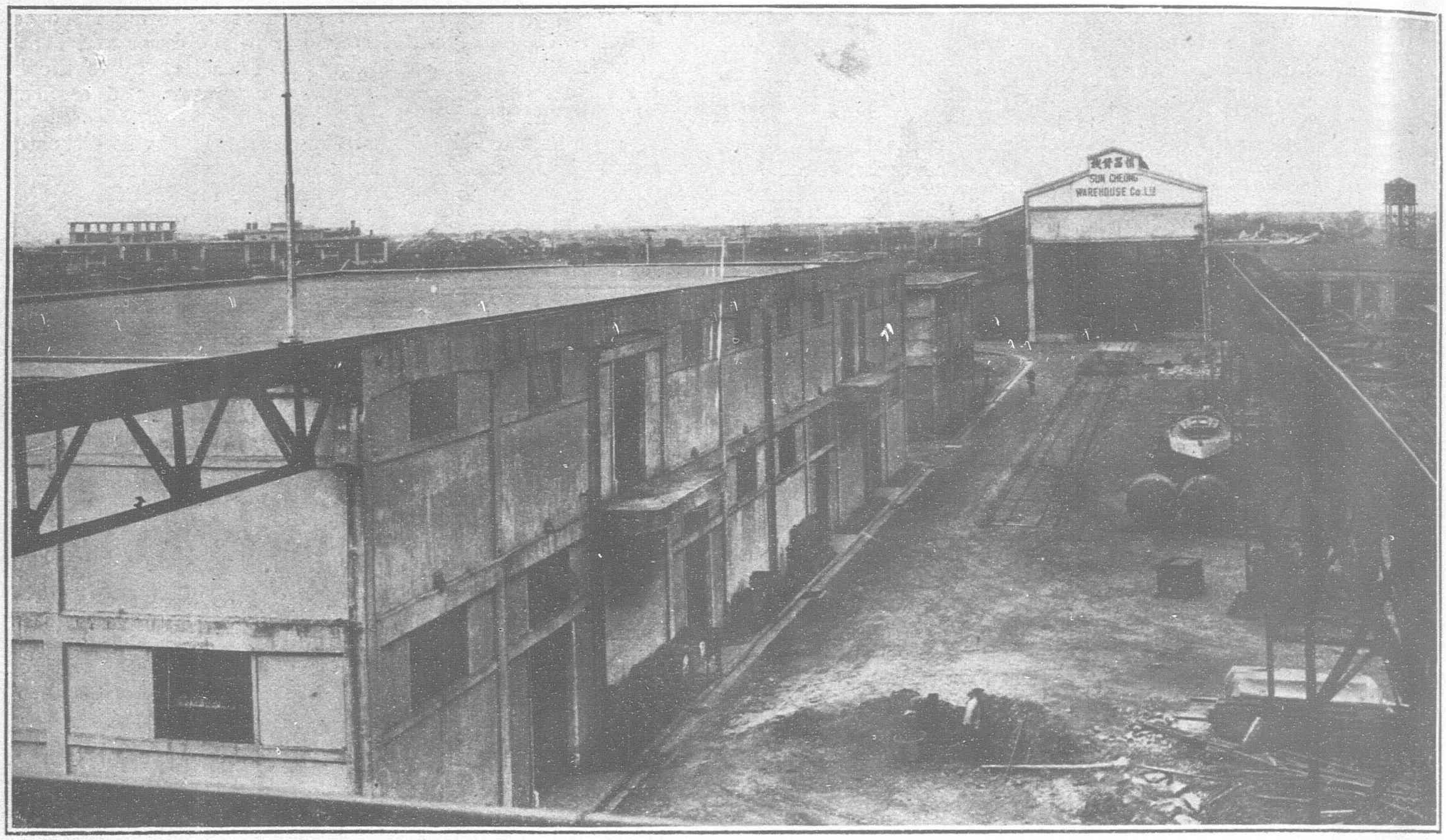
imported, while the year before $2,216,000 approximately Yen 4,430,000 were imported from America alone. A large part of the importations of the year were made early in the year prior to increase in duty on radio apparatus levied by the Government in March.

The Tokyo Electric Company has been one of the pioneers in radio industry in Japan and they are at present engaged in the manufacture of receiving and transmitting tubes of all sizes as well as receiving sets of many different kinds from crystal sets with one stage of amplification to 18 tubes superheterodyne sets. This company is now actively interested in the short wavelength broadcasting and receiving and has just received an official license for a short wave broadcasting station JKZB with wavelength of 5, 38 and 80 meters.

Mr. Yamaguchi, vice-president of the Tokyo Electric Company, has been active in the organizing and management of the broadcasting associations in Japan and has done much to further the progress of radio in that country.



This Map of Japan Indicates How Well the Broadcasting Stations are Already Distributed



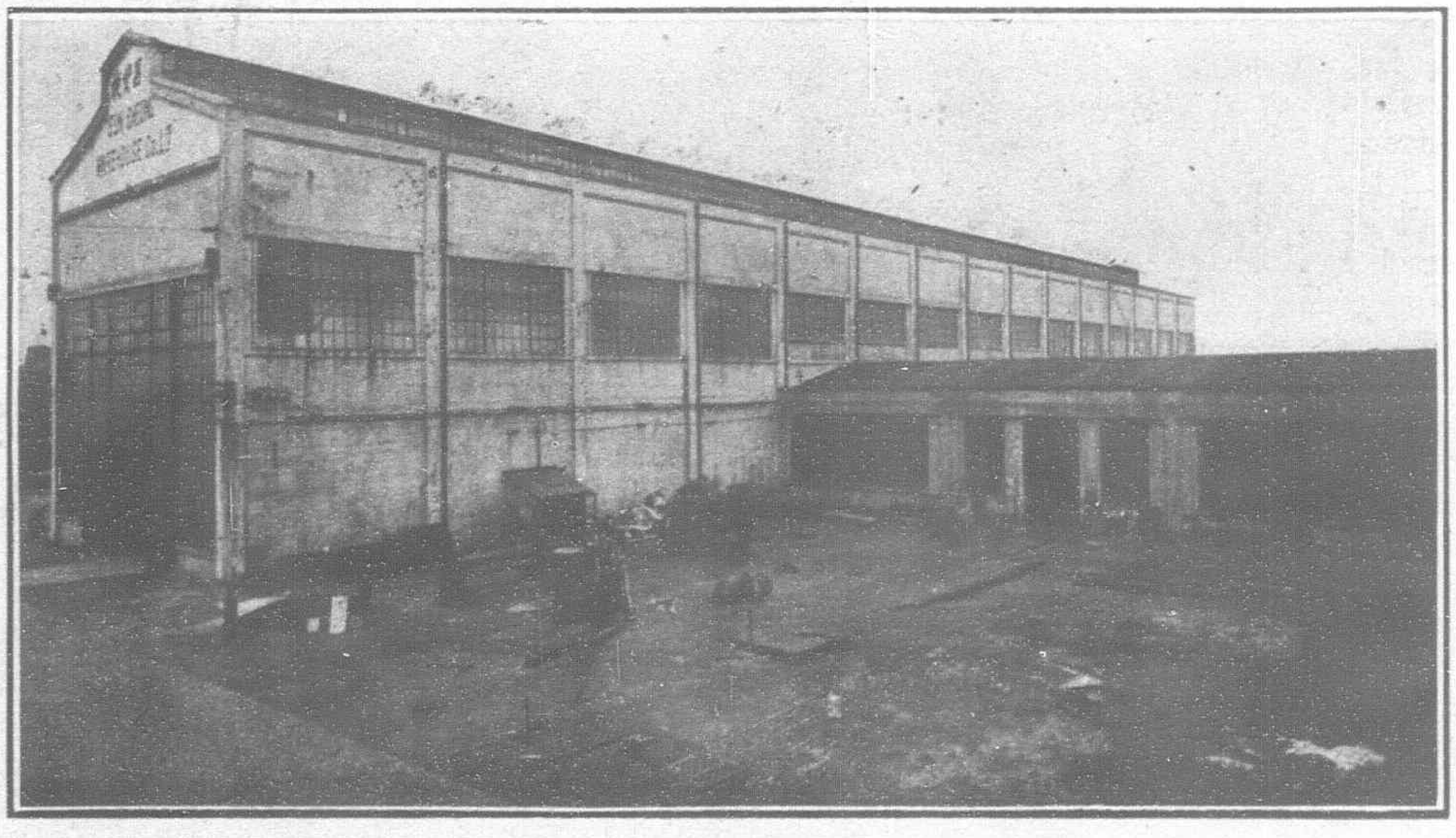
The Sun Choeng Warehouse Co., Yards and Crane Way

A Modern Warehouse in Shanghai

LOADING and unloading heavy cargo in Shanghai Harbour has always presented a problem not met with in other ports of similar size. Much of the ocean-borne cargo is discharged into lighters in mid-stream, into lighters alongside steamers on the Pootung side of the river and on to wharves on the Pootung side.

All ocean going vessels and many coast and river vessels have derricks for handling lifts up to 20, 30 and 40 tons, but the difficulty arises when such heavy cargo has to be taken from lighters for delivery to destination in Shanghai.

On merchandise, where cases are less than 1 ton in weight, coolie labour can compete with mechanical devises, but above a limit of 1 ton or, at most, 2 tons cost of handling by coolie is excessive. Several of the wharves have cranes capable of lifting packages up to 7½ or possibly 10 tons, but beyond such weights at the present time the plant of the Sun Cheong Warehouse Co. provides the only mechanical means of loading and unloading and transferring to trucks on a Municipal highway heavy lifts in excess of 10 tons and up to 20 tons.

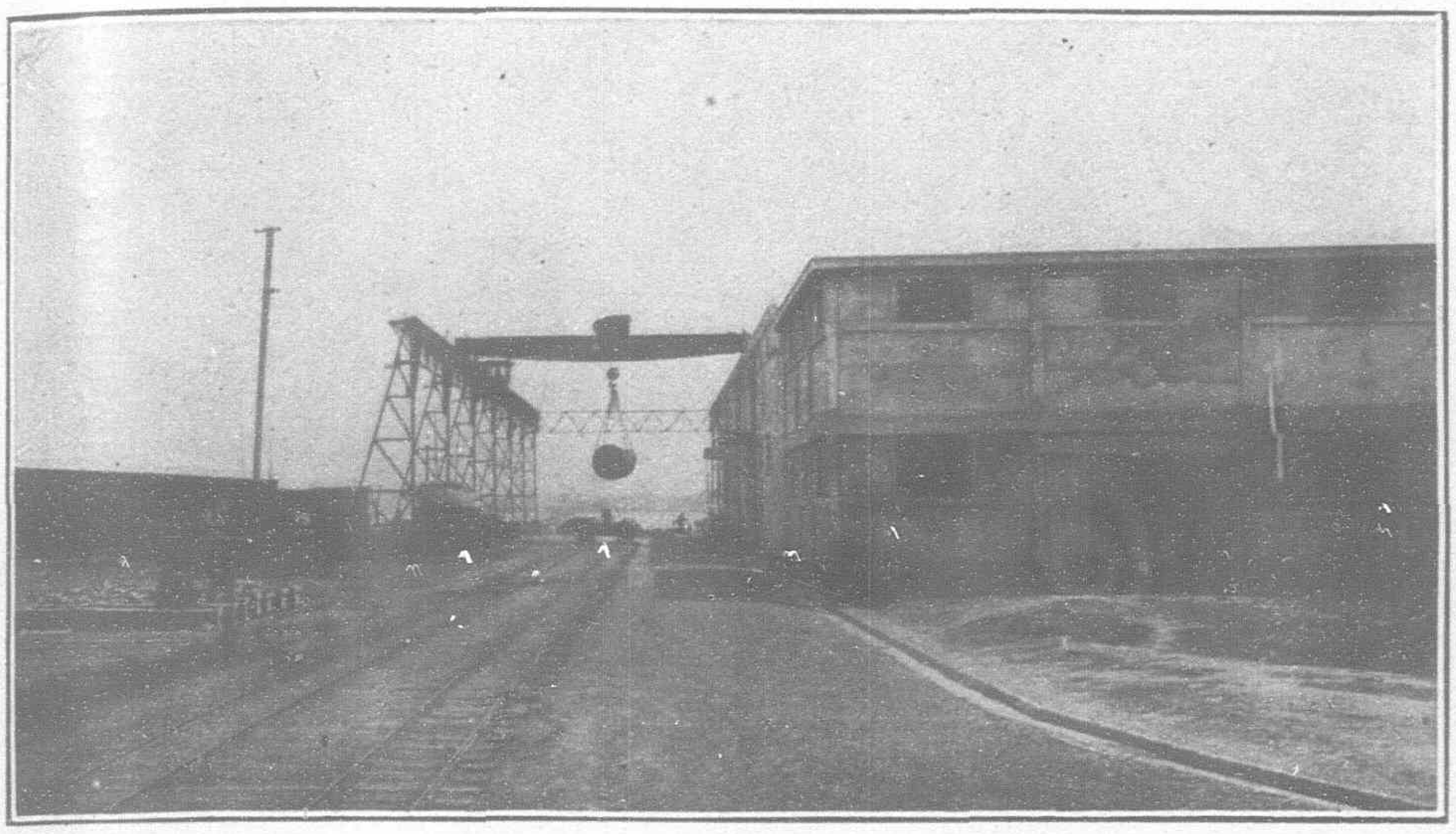


Steel Frame Godown and Machine Shop

The Sun Cheong Warehouse Co., Ltd., an American company incorporated in the Philippine Islands, was formed 10 years ago primarily for handling and warehousing importations of machinery and equipment by Andersen, Meyer & Co., but also to offer to industrial enterprises, forwarding companies, etc., a cheaper and more expeditious means of handling heavy machinery than any available at that time, and to offer warehousing facilities at competitive rates to those quoted by the various wharves and godown companies and particularly attractive storage for heavy machinery.

The property is situated on the north bank of the Whangpoo River on Tungliang Road, Yangtszepoo district, 4½ miles from the Bund and Nanking Road. In area it is slightly in excess of 5 acres with a river frontage of 250-ft. and a frontage on Tungliang Road of 850-ft. The main entrance on Tungliang Road is approximately 900-ft. from Yangtszepoo Road. The entire river frontage is bunded and stone-faced and the level of the entire property is well above high watermark.

A concrete faced loading basin has been constructed from the Whangpoo Conservancy normal line sufficiently far into the property to enable of the berthing of lighters up to 500 tons register and to enable of the discharge of 500 ton lighters by a crane having a capacity of



The Crane Way

20 tons, the crane gantry extending sufficiently far over the basin to enable of discharge from all hatches of a 500 ton lighter without swinging the lighter. To this loading basin a channel has been dredged to deep water in the river to enable of 500 ton register, lighters being berthed at all except very low tides. This channel is periodically dredged by the Whangpoo Conservancy.

There are seven buildings of permanent construction on the property :

1.—A two-storied reinforced concrete building divided into four sections by fire-proof walls. Cargo can be delivered to each of the four sections of this godown directly from the 20 ton crane which operates over the loading basin. This building is used for the storage of cased goods in weights not exceeding 1 ton. Mechanical tiering machines are used to save on coolie labour and to obviate unnecessarily rough handling.

2.—Structural steel building along the entire length of which cargo can be moved by a second 20-ton cranee The unusual height of this structural building allows of the handling of the very bulkiest packages and any package which can be loaded on the largest steamers calling at Shanghai can be handled to and from this building by the 20 ton crane. Adjacent to and opening from this structural steel building there is a second structural steel building of 10 bays each 80-ft. by 20-ft., two bays of which is used as a hazardous godown, being provided with approved fire walls and fire doors. Four bays are used for the storage of cargo up to but not exceeding 5 tons in each package. One bay is used as a textile repair shop and textile machinery demonstration room and four bays as a machine shop. All of the ten bays, with the exception of two, the hazardous godown, are equipped with 5-ton cranes with a span ot 20 feet travelling the entire 80-ft. length of the bays.

3.—A two-storied reinforced concrete godown which is used for storage of general cargo for Pattern Maker and Carpenter Shop and as a Packing Room for incoming and outgoing cargo. The Pattern Maker and Carpenter Shop is equipped with modern woodworking machinery. Part of the upper floor of this godown is used by Andersen, Meyer & Co. for the assembly of mosaic floor tiles of special designs.

4.—An open front shed 400 ft. by 30 ft. which is used for storage of merchandise which, although requiring protection from the weather, does not necessarily call for inside storage. Certain parts of this shed are specially fitted with racks for storage of pipes, tubes, reinforcing bars and other commodities which require grading and storing by sizes.

5.—A brick building used as a mess hall for the foreigners employed by the Company.

6.—A garage for housing the Company's fleet of electric and gasolene trucks.

7.—Building housing transformers. The Company takes current from the Shanghai Municipal Council for lighting and power. There is installed on the lower floor of this building a complete battery-charging plant for charging the batteries in the Company's fleet of Milburn and Walker electric trucks.

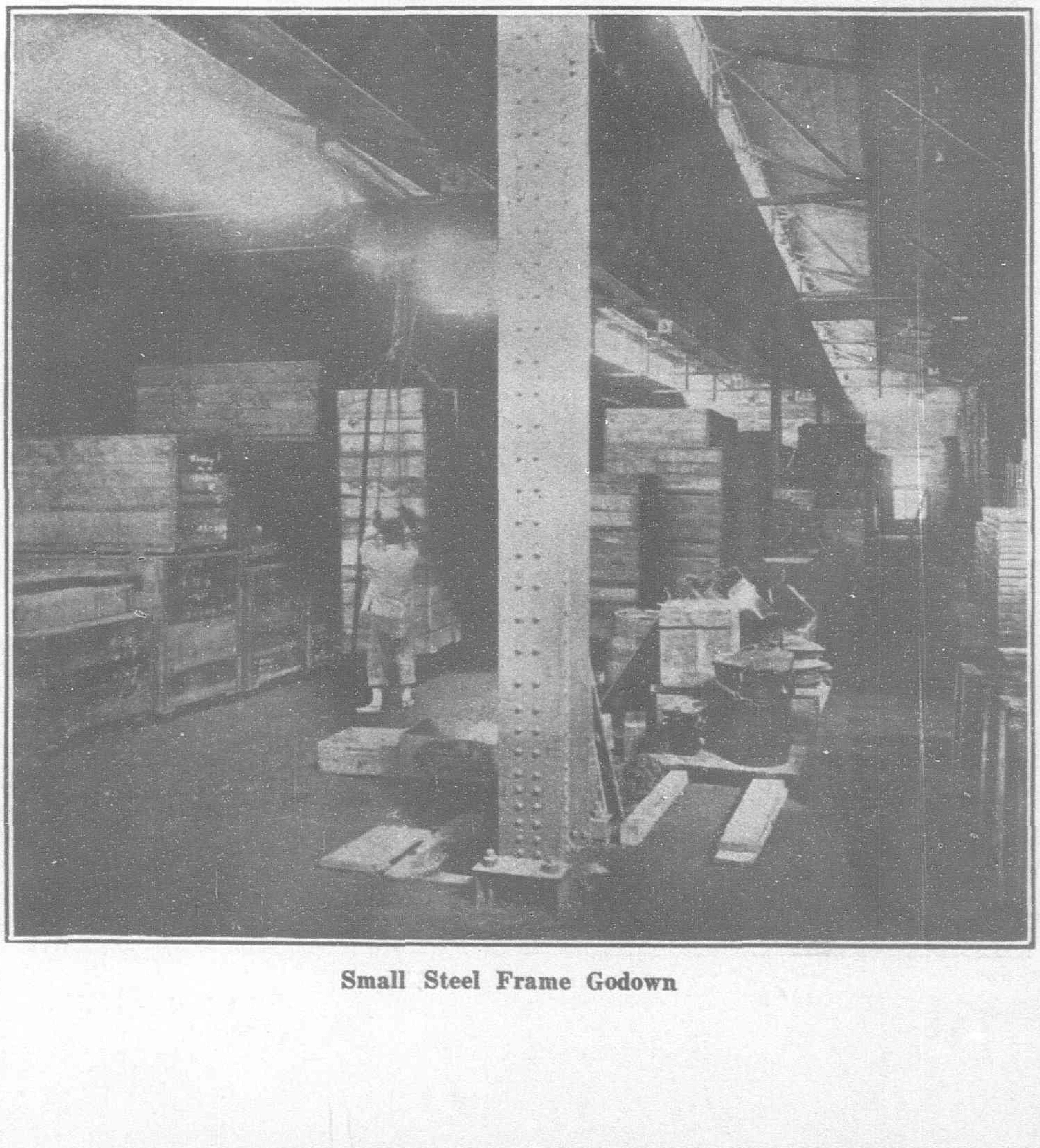
The total floor space of the various warehouses (exclusive of space used by the Textile Repair Shop, Machine Shop and Carpenter Shop) is 95,000 sq. ft., all of which is available for storage of cargo. The effective cargo capacity of the various warehouses, making allowance for the storage of heavy equipment and leaving sufficient space to facilitate the free movement of cargo, is approximately 20,000 tons of under cover storage, in addition to which the Company can take up to 20,000 tons of outside storage, a large part of which can readily be placed and picked up by cranes.

All of the godowns have good lighting and ventilation and, except the steel godown with 20-ton crane, all have concrete floors.

The two 20-ton electric travelling cranes have a span of 50-ft. with a run-way of 300 ft. Each of the cranes can handle from 50 to 150 tons of cargo per hour and can stack cargo up to a height of 25 ft. The crane over the loading basin can unload two 500-ton lighters per day.

The premises are equipped with adequate approved fire protection and the various warehouses take the lowest fire insurance rates.

The Textile Repair Shop, which is equipped with modern machinery and which is operated by Andersen, Meyer & Co. under



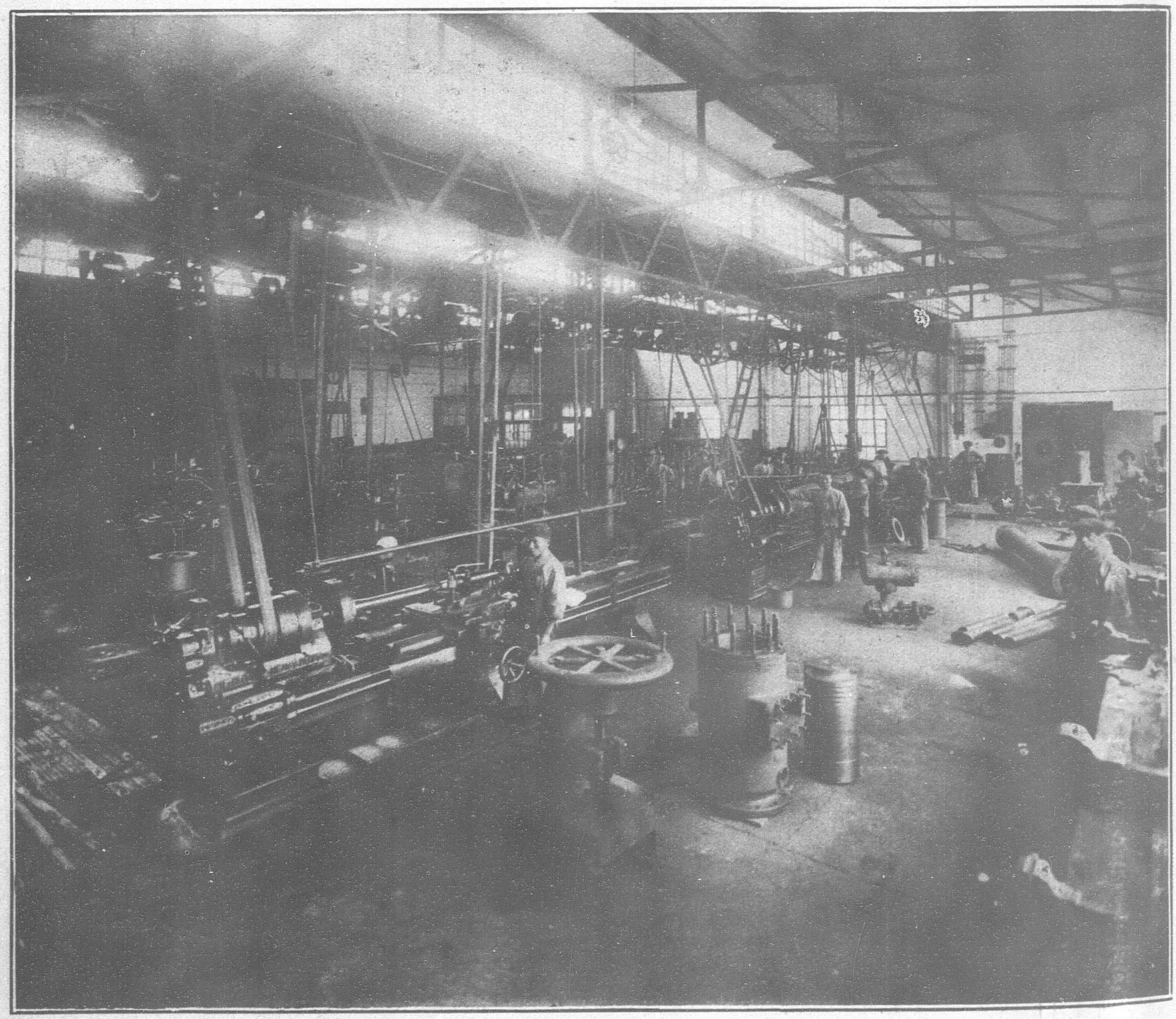
Small Steel Frame Godown

foreign supervision, was started in order to provide the various cotton mills in China with a service for clothing carding machines. Many of these cotton mills in China make use of this equipment, particularly those which are equipped with Saco-Lowell cotton spinning machinery.

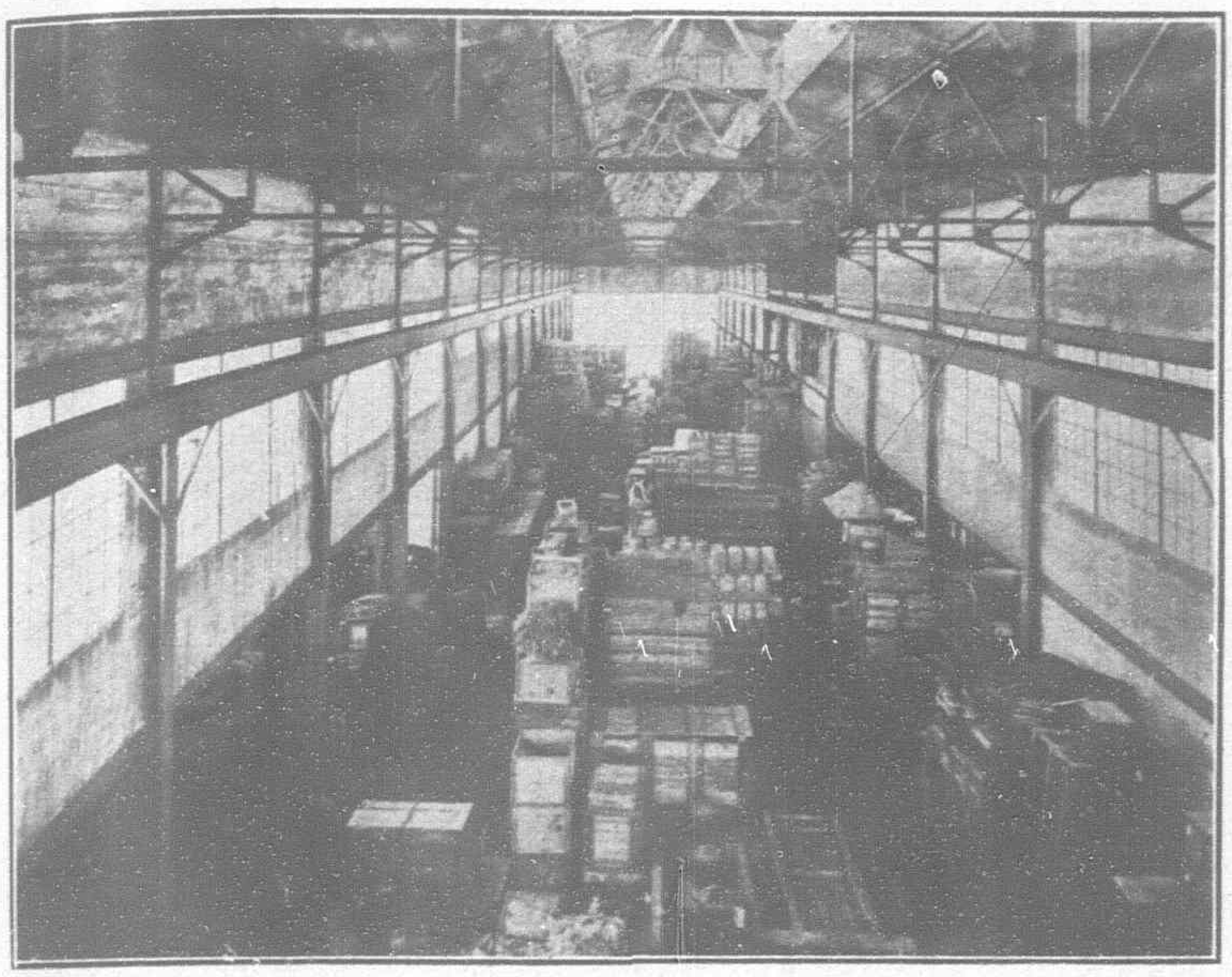
In the same building which houses the Textile Repair Shop, Andersen, Meyer & Co. have an experimental and demonstration cotton spinning room, in which is installed a complete unit for spinning under latest approved methods, and necessary equipment for testing the various yarns taken off the machines under various conditions of manufacture, with varying qualities of cotton and under various degrees of humidity, a complete humidifying system having been installed. Andersen, Meyer & Co., are able to demonstrate a type of cotton spinning which is new to China and which is known as the long draft method.

The Machine Shop has a floor space of 80 ft. by 80 ft. and this also is operated by Andersen, Meyer & Co.

Interior of Concrete Godown



Machine Shop

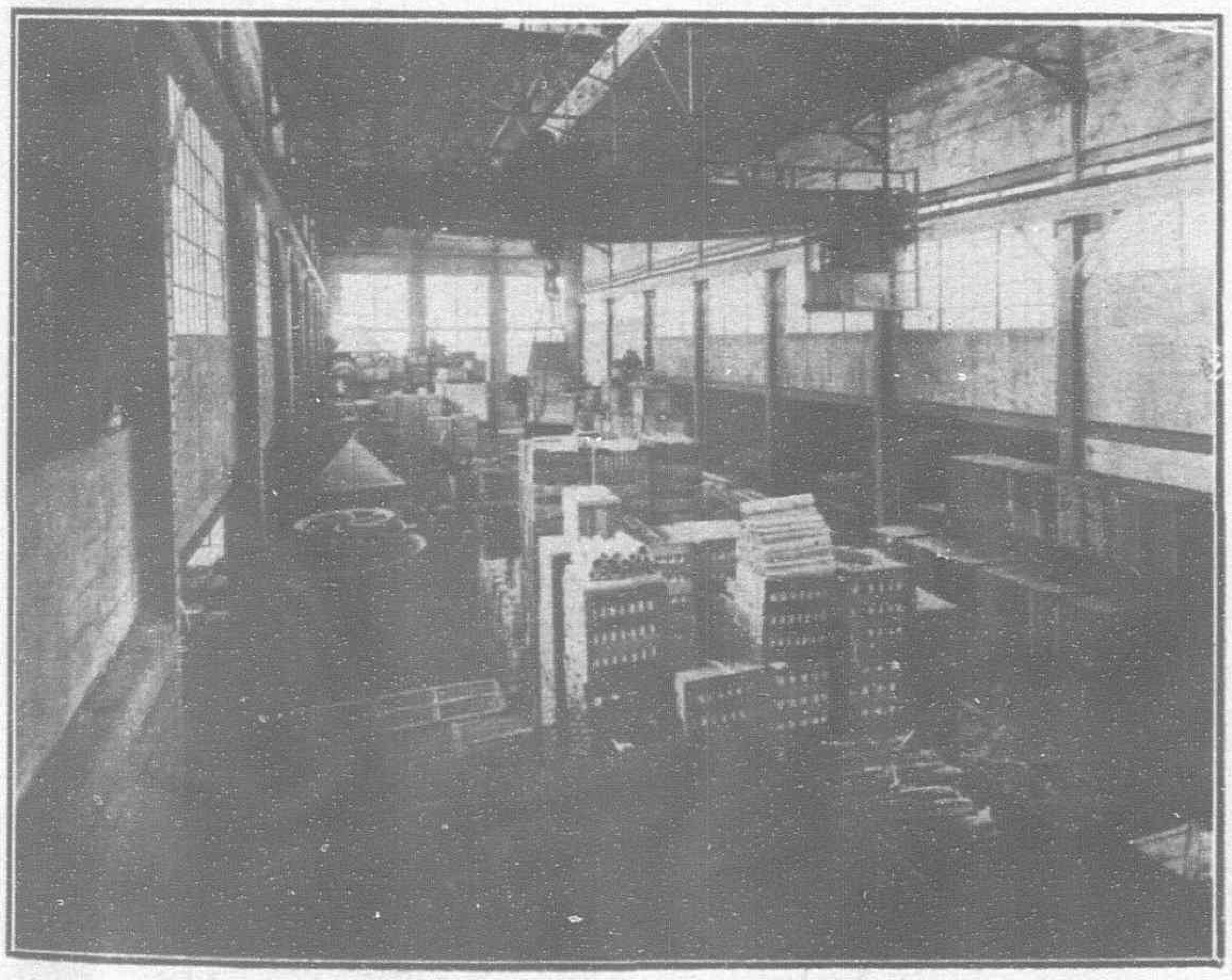


Interior of Steel Frame Godown

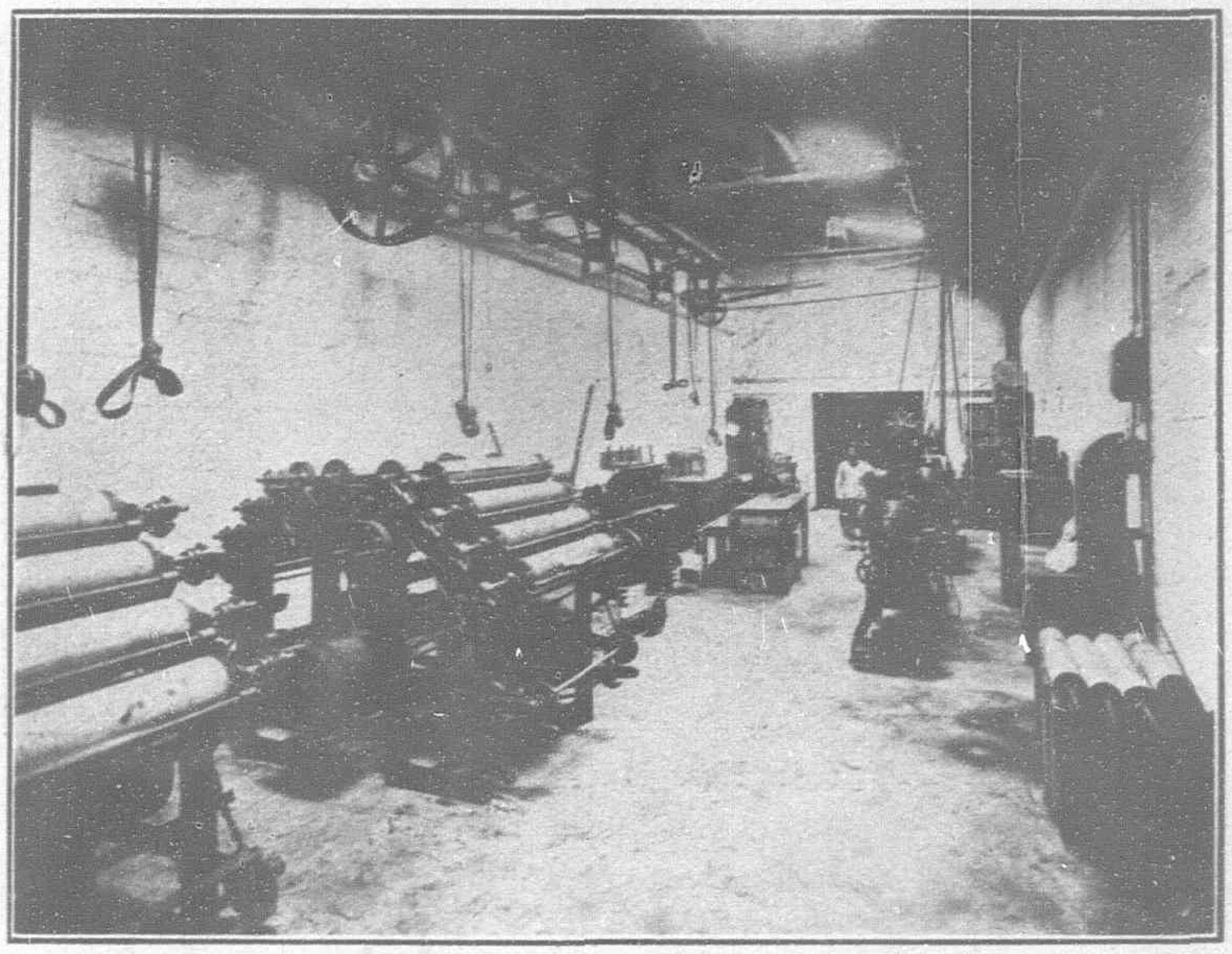
under foreign supervision and employing approximately 100 men. It is equipped with 30 metal working machine tools and carries out repairs to and re-conditions plants and machinery supplied by Andersen, Meyer & Co. It also acts as a service organization to the numerous customers who have bought industrial equipment and machinery from Andersen, Meyer & Co.

In addition to repairs the Machine Shop has carried out a very considerable amount of fabrication of steel for bridges, steel frame buildings, etc., amongst others steel frame sheds for the Chinese Maritime Customs at Chefoo; steel frame work for the Sun Sun building, Nanking Road; coal storage hoppers and coal handling gear for an electric company in South China, also structural steel frame building for this same company; a 300 ft. suspension bridge erected in Chekiang Province and a steel girder bridge for Kiukiang.

The Shop also carries out a considerable amount of boiler and tank work. It is equipped with oxyacetylene and electric welding equipment.



Another View of the Same Godown



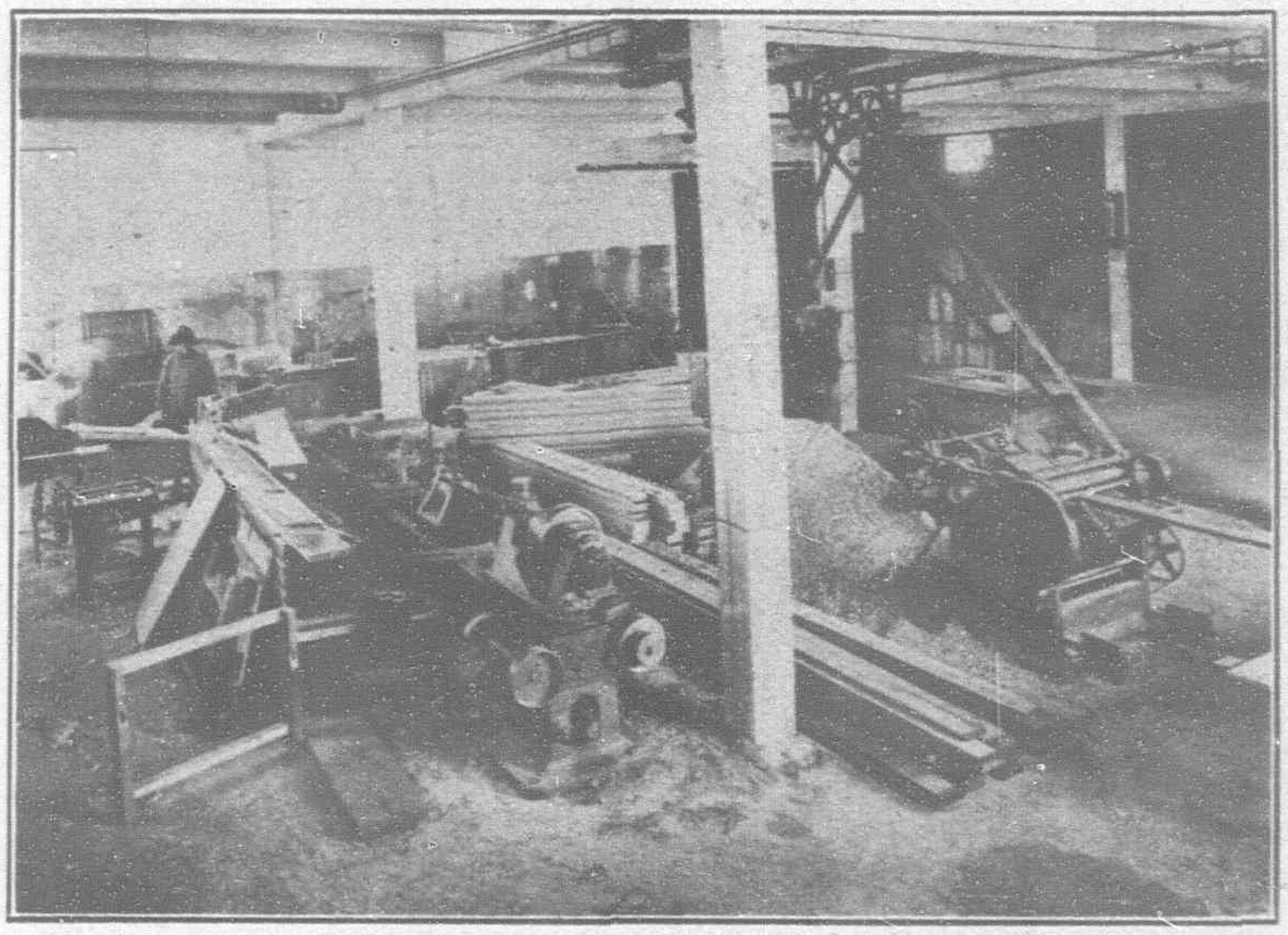
Textile Machinery Repair Shop

The plate machinery, punches, shares, rolls, etc., are located in the yard outside the entrance to the Machine Shop. The Shop is also equipped with compressed air and makes use of air hammers, drills and punches in fabricating steel work.

The Sun Cheong Warehouse Co. quotes rates for heavy lifts which are considerably lower than those at which cargo can be moved by coolie labour. The crane service has been largely used by Andersen, Meyer & Co. and it has also been widely taken advantage of by such companies as the Shanghai Municipal Council, French Tramway & Electric Light Co., etc., etc., also at various times considerable quantities of heavy lift equipment, the property of the Shanghai Defence Force, have been entered and cleared through the premises of the Company.

The Company also quoted favourable rates for storage and is in a position to quote rates from steamer to destination including all heavy lift charges.

The General Managers of the Company are Messrs. Andersen, Meyer & Co., Ltd., and the agents Messrs. Wheelock & Co.



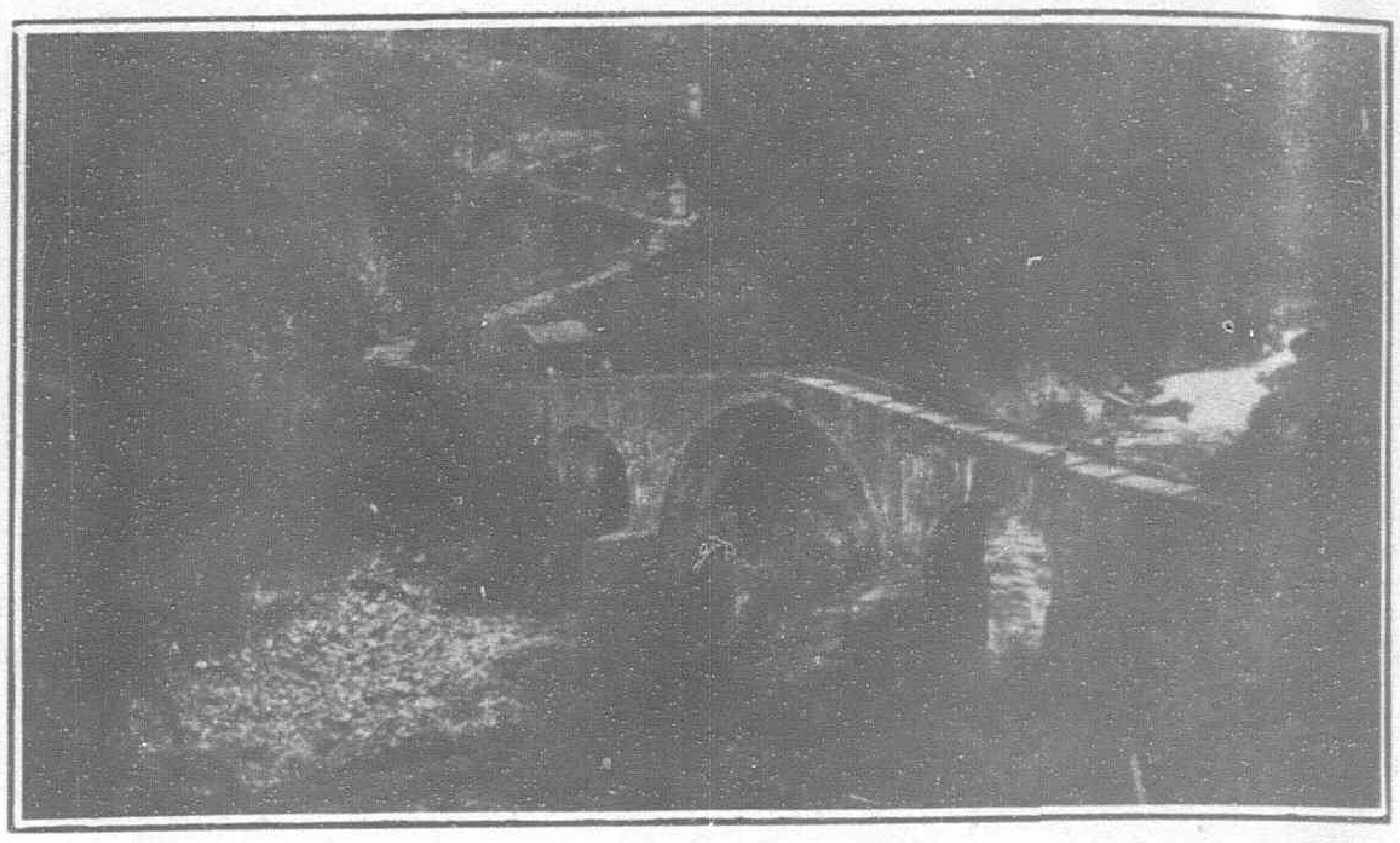
Pattern Maker and Carpenter Shop

Book Review

The Superheater Company of New York has issued a booklet recently entitled "Locomotive Progress," in which are illustrated a few representative examples of modern motive power. No attempt has been made to show all the very latest locomotives, nor are all the locomotives included necessarily the latest ones built. But they are representative, we believe, and give a fair cross section of steam power in America to-day. In each instance, general dimensions are given. These have been carefully compiled from the records of our Engineering Department and checked against and supplemented by those of the builders. In some cases they were checked by the railroads themselves. All the locomotives illustrated, of course, are equipped with Elesco superheaters, either of the Type "A" or Type "E" design. A number are equipped with either Elesco feed water heaters or Elesco exhaust steam injectors showing the general tendency of railroads to accept these economy devices. Other facts concerning the design, equipment or service are also given.

Copies will be gladly sent to anyone desiring them.

Good Stone Bridge on New Motor Road West of Yunnanfu



The New Chang-ti Bridge West of Hwangtsopa, Kweichow
Cost About $50,000.00

China International Famine Relief Commission

Report of the Engineering Department

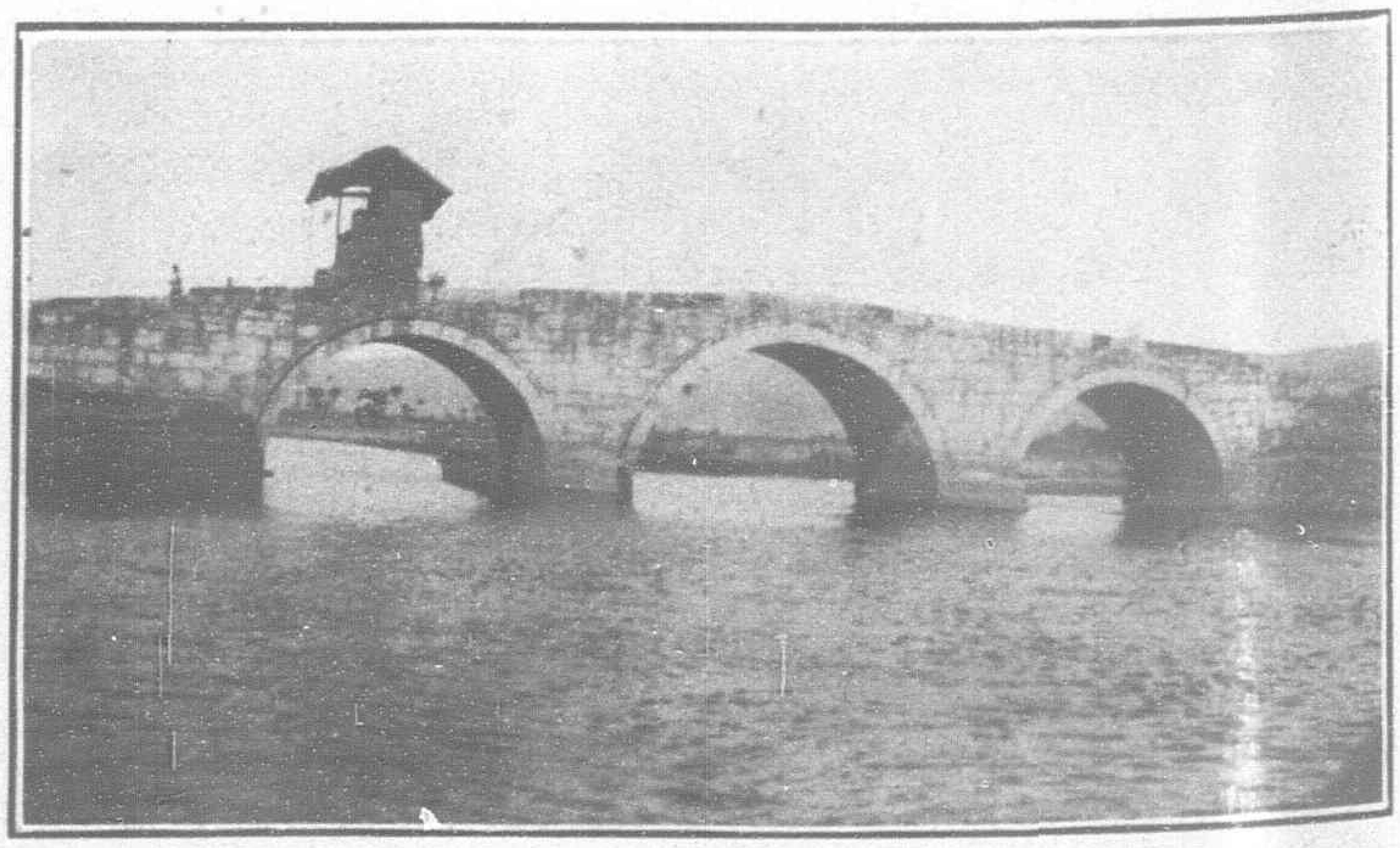
By O. J. Todd, Chief Engineer

As in the two preceeding years, 1926 saw an active program of investigations carried out with the initiation of work in new regions. In spite of civil commotion, our engineers were able to carry on work in a number of provinces and extend our activities into the extreme south-western parts of China—new territory for this Commission to organize and begin to help on the same basis as support had been given in the North in previous years. This extension of the work of the Engineering Department to include all of the provinces of China proper had been planned, at its inception in 1923, but difficulties of transportation had confined the Commission's work to the Northern and Central provinces for the most part.

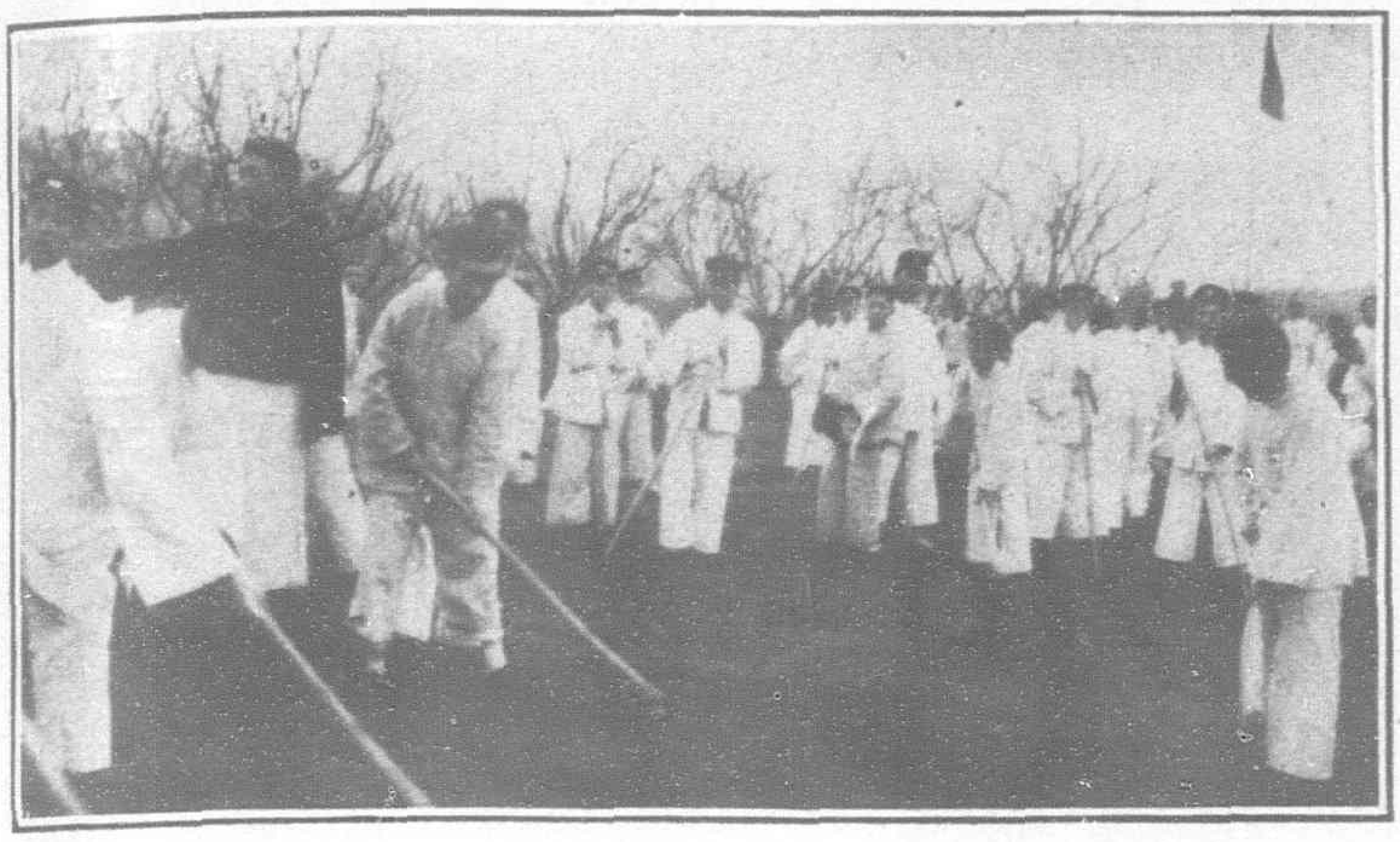
Old Stone Bridge just North of Kwang Kao Shu

Yunnan and Kweichow organized for work soon after receiving their quotas of the famine surtax early in the year and application was made to the Chief Engineer to furnish staff and later to come himself and lay out the work of motor road construction after studying the field. As early as May, a Chinese returned student engineer, Mr. Pond, was sent to Yunnan to make preliminary studies. In early October, the Chief Engineer left Peking in response to the requests from these two provinces and spent the remainder of the year in the field on their problems. While on this mission, he also visited Kwangsi and Kwangtung making preliminary arrangements for branch committees in these provinces and studying the road and waterways situation there. The interest that had been manifested in other provinces by local officials was exceeded

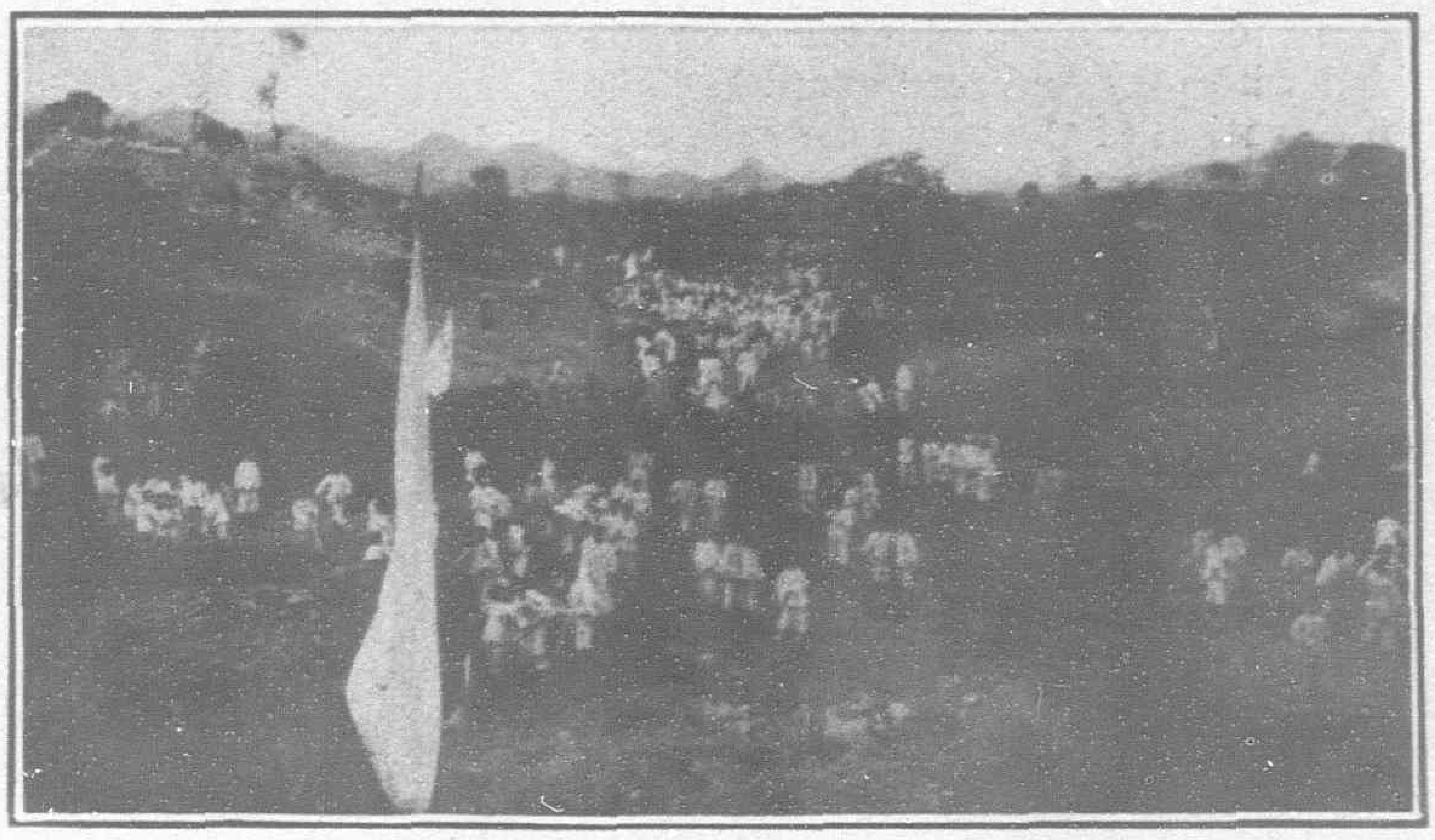
Typical Temporary Bridge with Palm Tree Trunks for Piles



An Old Toll Bridge Between Chu Ching Fu and Lu Liang
Liangtze Chiao



Kweiyang Students at Work on the New Motor Road



Students on Kweiyang Road Building

by those of the Southwest where every possible means of co-operation was offered the Commission's engineers. By December, active construction work was going forward in both provinces.

Though considerable dike work had been going on all spring and summer in Chihli and some road building was done in Honan, there were no other famine prevention projects of consequence carried through the construction stage in North and Central China this year. Some money had been spent in road and dike repairs along the Yangtze, but this was in such small units and so many places as to make none of them noteworthy. This does not mean that there was no need for comprehensive dike projects in the middle Yangtze valley region for the floods of last July caused serious dike breaks with heavy loss to life and property along the Han, Siang and Han Rivers in Hupeh, Hunan, and Kiangsi, respectively. Work on these repairs should have begun late in the year after the floods had receded but change in government following civil war delayed this work throwing it over for 1927.

Investigation and Inspections

The Chief Engineer was in the field on inspections of old and new work and in carrying on new investigations fully half the year. In these various trips he covered fourteen thousand miles making a total of more than fifty thousand miles travelled by him in pursuit of his duties with the Commission in the first three years of the life of the Engineering Department all within the eighteen provinces of China. He checked up on the 1925 dike work on the Han River and the Yangtze in Hupeh returning to the Shihshow project at extreme high water in July to see this work withstanding the floods. Other inspection work included three projects in Honan, three in Chihli, one in Shantung, three in Yunnan, and two in Kweichow.

Description of Projects

The various photographs used to illustrate the report were mostly taken by the Chief Engineer to show progress of work or conditions of the country in new regions where work is being begun. Beside taking several hundred such pictures during the year, he has also inaugurated the practice of preserving on cinema film some of the interesting features of the Commission's engineering work. This is a new departure in our recording which will be continued on a more extended scale in 1927.

A short description of the work by provinces as undertaken by this Department is given below followed by the statistical table referred to above. These are given in brief for the general public with the feeling that only a few readers would be interested in the more extended technical reports on file in the Commission's offices at Peking.

Chihli Work

The dikes east of Paotingfu in the West Lake region and to the east were planned in 1925 but no arrangements could be made with the officials at that time and the work went over a year. However, early this year with the famine surtax money at hand the work was begun in April and completed in August in the districts of An Hsin, Hsin An and Ta Cheng. The total work done here cost $300,000.00, half of the cost of which was contributed by the districts benefitted. Only a small portion of the North Dike near Hsin An was left for the native officials to complete themselves after they had failed in their negotiations with four of the local villages who preferred to make their own dike repairs. On the whole our work was highly successful in this West Lake region where additional crops valued at no less than $5,000,000.00 are now being harvested annually as a result of this protection from flood.

The Thousand Li Dike

The most important piece of work done in Chihli in 1926 was the closing of a breach near the east end of the Thousand Li dike in Ta Cheng Hsien. Through the completion of this work, the well-known vast area of Wen An Wa is protected from inundations.

This part of the dike, being on the border of a lake, is always exposed to an intense wave action when the strong northeast wind prevails in the summer. During the reconstruction, special care was taken to build up the dike in thin layers of good earth, thoroughly tamped with iron or stone flappers. To guard against wave

Soldiers Building Roads at Kweiyang

Governor Tsao Hsi Tsun Can Use a Chinese Hoe in Road Building wash, the river-side of the dike was provided with piles and reed bundles. The top elevation of the new dike was made three feet above the highest recorded flood level, and it has a top width of 25 feet, with side slopes of 2½ to one. It is much more substantial than any other dike maintained by the local people in the vicinity.

An Hsin South Dike

The repairing work of the An Hsin South Dike is distinguished for its large volume of earthwork which amounted to some 300,000.00 fangs. The work extended over a stretch of dike more than 100 li in length, bordering the river Fu Ho and adjacent lakes. In most places the borrow pit was under water and the dike-building material had to be carried on boat from a long distance. On the slopes of the dike willow shrubs were planted so as to reduce the effect of erosion due to rain and wave action. Total cost of the job was nearly $200,000.00. Area of land immediately reclaimed is about 240,000 mow, and in the following years 160,000 mow more will be available for cultivation when the flood water of 1924, which was still two or three feet in depth at the time of our work, is removed through evaporation and drainage.

A Mountain Road South of Tungtze

An Hsin North Dike

The repairing work for the North Dike of An Hsin covered a distance of more than 50 li in length. The dike runs partly along the north bank of Fu Ho and partly on the bank of the Shao Chih Tien lake. On the part of the dike facing the lake, heavy construction was undertaken and special provision was made to take care of wave wash. This necessitated the use of piles and reed bundles on the river side of dike for a distance of 2,000 feet. Bricks were placed on top of the reed bundles as an additional means for keeping the latter in position and resisting erosion.

This work was started at the end of June, with 2,000 men steadily on the job for 50 days. After summer flood, a smaller force of 300 to 400 men was maintained up to the end of October. Cost of construction was $53,000.00. Land reclaimed was about 240,000 mow.

Houtao Irrigation Project

It was said in our last annual report that a preliminary survey including some hydro-logical investigations had been made in the fall of 1925 for an irrigation project in the Houtao district. Studies were then made as to the method of improving the existing irrigation system and increasing the value of land for agricultural purpose. It is recommended that work to be undertaken in this region be divided into three stages.

First, the Yung Chi Canal is improved so as to irrigate the western portion of the plain. This will require the construction of training works on the banks of the Yellow River, the provision of regulating gates at the intake of the canal as well as at the entrances to its laterals, dredging the channels, and dike repairing along the lower stretch of the canal. While construction work is being carried on for the Yung Chi canal, topographical and hydrographical surveys for all other canals in the Houtao area should be undertaken and experimental stations for making agricultural studies should also be established.

Secondly, all other existing canals are attended to. When this is done, all the area that can be served by gravity system will be taken care of.

The third stage, consists of raising the water to a higher level so as to reach the high lands in the area. This can be accomplished either by building a weir across the Yellow River or installing pumping stations at the mouth of the canals.

Irrigation improvement together with the extension of the Peking-Paotou railway would in the future make this Houtao area, which has more than eight million mow of cultivable land, the home of at least one million people.

The Shih Lu Irrigation Project

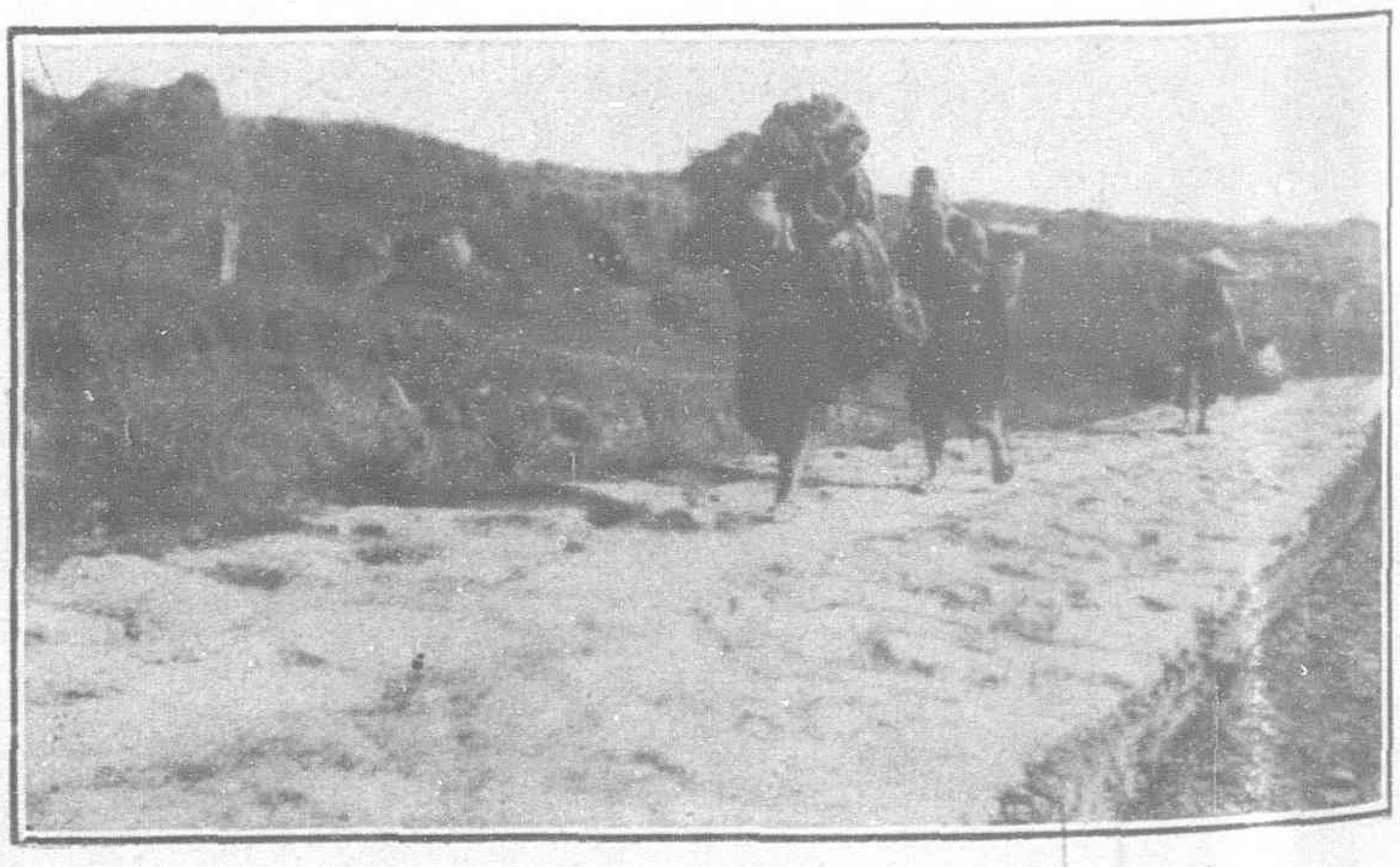
The Shih Lu Irrigation scheme has been delayed by civil war and difficulty in completing negotiations. This prevented the commencement of construction in the fall, but at the end of the year all preliminaries were arranged so that construction may go forward as soon as the frost leaves the ground in the spring. The plans with all details were completed during the year.

Hupeh Work

As stated in the 1925 report, important dike projects were carried to successful conclusions at Tsekow on the Han River and Shihshow on the Yangtze. Inspections were made of both of these last March by the Chief Engineer who found them in excellent condition. A new piece of dike repair was then undertaken on the Han River at Han Chuan, 60 miles above Hankow. This was carried through at a cost of $25,000.00 during April and May under the direction of a junior engineer, Mr. Chang.

A second trip of inspection to the Shihshow dike was made by the Chief Engineer in mid-July when the Yangtze was at flood height. The dike was found to be in first class condition and not requiring any repairs though many old native dikes down river

Main Street of Pan Chiao, a Lolo Village 40 li East of Yunnanfu



Lolo Women Bringing Produce into Yunnanfu were giving away. It was then estimated that the crops of beans, cotton and rice being grown this year on the reclaimed area of 200,000 mu back of this dike had a market value of more than $5,000,000.00. It will be recalled that the dike work last year cost about $150,000.00 and that this area had been subject to annual flood for the past seven years. To further insure this area, the local officials built a new secondary loop dike at the Ershenshu bend, six miles east of Shihshow completing this in July at a cost of about $75,000.00. It seems likely that this reclaimed area will continue to yield annual crops valued at several millions.

Unfortunately there were no funds in the hands of the Hupeh Committee to commence the repairs of the Sin Ti dikes near Hankow at the close of the year. However, efforts are being made to assist in putting good dikes in this district to replace the old ones that went out last July. This will be a costly undertaking in which the full support of the provincial officials is expected. Both here and up the Han River, where $300,000.00 were wasted this year in dikes built under improper supervision by local officials and which washed out in August, the Engineering Department hopes to render service to prevent further floods in 1927. In this, it is proposed to co-operate with the new Hupeh Dike Bureau.

Shantung Work

One trip of investigation was made into northern Shantung in late September to look into the problem of drainage at Lintsing and also Tungchangfu along the Grand Canal. Heavy rains had left large areas under water for weeks, doing heavy damages to crops. Much of this danger might be removed by a local drainage system suggested by the Chief Engineer. At Tungchangfu, the Tu Hai Ho would have to be cleaned for several miles. A thorough survey was recommended, but as yet the local committee has not taken up this project.

The dike break in the Linpuchi district along the Yellow River was finally repaired by a local organization using old Chinese methods. To assist in the work, our Shantung Committee contributed $90,000.00 but no representative of our Department was on the work as the handling of the project was left to provincial authorities.

Szechuen

Though political disturbances in Szechuen continued to postpone the starting of construction of the motor road from Chungking to Chengtu a sum of $54,000.00 has been set aside by our Chungking Committee for this specific purpose. More will be added to this in 1927. The Chief Engineer proposes going over this route on foot during the coming summer to estimate the cost and make arrangements for getting the work started. Some of the officials wired him to come into the province in November to help begin the work, but his duties in other provinces prevented his going there, this year.

Yunnan Work

Reaching Yunnanfu in late October, the Commission's Engineer found the local committee agreed on a program of motor road construction. With the $300,000.00 on hand it was decided to build an earth road to the north east through Yanglin to Yangkai, a distance of nearly sixty miles. The plan is to build a well crowned earth road first, using it in the dry months only until further funds could be found for macadamizing it. A similar road ten miles long has already been completed to the west of Yunnanfu by a local road bureau.

With Resident Engineer Pond, our Chief Engineer made a careful study of the route to the north-east of the capital in early November, and wrote specifications for the construction. A month later, there was a formal opening of the road work in which ceremony the provincial officials took a prominent part. It is planned to complete this work within a year. As funds can be raised, this road will be continued to the north. It is the beginning of a genuine movement to open up Yunnan Province to something faster than pack mules.

In going from Yunnan to Kweichow, the Engineer of the Commission investigated the Chu Ching Fu river project and made a report to the local committee and the Governor of Yunnan. Heavy silting of the bed of the Nan Pung Kiang has been going on these past few years due to the annual construction of earth dams across this stream to divert its waters for irrigation. The situation requires an engineer competent to make further studies and finally do a job of channel cleaning.

At Lo P'ing to the south-east of Chu Ching Fu is an irrigation project requiring further study. The Chief Engineer spent two days investigating this and then reported on its feasibility to the chief official General Hu. This is a scheme for diverting water from a branch of the West River into a side-hill canal whence it goes twenty miles to a point where the range will be tunnelled and the water sent through into the Lo P'ing plain to supplement the natural rain fall. This project is estimated to cost $500,000.00.

Kweichow Work

After a three weeks journey overland on foot and by chair, the Chief Engineer reached Kweiyang where he found road building already in progress. Here the Kweichow Committee of our commission was co-operating with the local authorities in constructing a motor road ten miles long around the provincial capital. Plans were made for a long trunk road to be built to the north to reach a navigable branch of the Yangtze. The Governor and all prominent officials were enthusiastic over this new road building program. Over a thousand soldiers were on the work and it was planned to put between 5,000 and 10,000 of them on the construction during the coming year. School boys and school girls were also enlisted in the work of local road building.

To investigate conditions from a famine standpoint and also estimate the cost of a good road to the north, the Chief Engineer spent two weeks going over the proposed route from Kweiyang to Tsunyi and Tungtze. From there the road is to go west to Chihshui, a total distance of about 400 miles from Kweiyang. The cost with bridges and macadam surface will be about $3,000,000.00. Engineers are being sent in from the Peking office to take charge of the Commission's end of this work since the Kweichow Committee has $300,000.00 on hand for this purpose. It is a picturesque country with steep peaks and deep river canyons. The present roads are stone paved as a rule but not fit for wheeled vehicles due to the many flights of steps found constantly. With no carts and no rail or motor roads in the province it is an isolated place to be. Motor road construction is now the crying need of the province.

Going to the south west from Kweiyang, the road is found similar to that to the north. The cost should run from $6,000.00 to $8,000.00 per mile with light macadam surfacing twenty feet wide. Notes were taken along the main old stone road from Kweiyang south to Singyinfu and then on to the Kwangsi border. Only one bad river crossing is found in this distance of 250 miles. This is the Hwa Chang Ho canyon, 2,000 feet below the pass on the south rim.

At Singyinfu, there is a large lake caused in the summer by the inrush of drainage from the surrounding hills. A rise of land near the city prevents rapid run-off. A canal that is highly inadequate has been dug to carry off this water, but it functions too slowly. The Chief Engineer looked into this problem and will have the necessary surveys made this coming summer, by one of his assistants being sent into Kweichow.

Work of Other Provinces

In passing south from Kweichow into Kwangsi, figures were made of the route and cost of a motor road to connect up Poseh, the head of navigation for the West River. As yet no roads have been built here. However, at Nanning it was learned that in Kwangsi at present there are a number of motor roads under construction the total of these for the year being 500 miles. These are being done by the province but are in the nature of famine prevention projects. It is proposed to organize in this province a branch committee of our Commission and co-operate in extending this system of highways.

Transportation on the West River was noted by our Engineer to be difficult due to the bad channel in low water. In many places the rocks are so numerous as to make navigation precarious. Both this work of channel cleaning and of making better dikes in the lower stretches of the river are matters to be considered by the new committee when it gets into operation.

In Kwangtung, where a new committee is about to be organized our Engineer reports progress in road building but a great need exists for better flood protection along the West River. The latter problem has had considerable study by a bureau that has made many surveys and prepared reports. Co-operation with this bureau

(Continued on page 569).

Land Improvement and Reclamation in Japan

By Dr. Kanichi Nachi, of the Ministry of Agriculture and Forestry, Tokyo, Japan

THE history of Japan tells us that even three thousand years ago our ancestors cultivated the land, and in those times it was thought that governing the country was identical with governing agriculture and the farmers. I will explain only the evolution that has taken place in the improvement of the cultivated land and the reclamation of waste land during the last 60 years from the end of the feudal age.

The period of the Tokugawa government may be considered the age of decentralization, when many hundred feudal lords were scattered to the respective districts given by the Shogun. A large part of the political affairs were agricultural and extensions of their territories were represented by the amount of rice offered as taxes by the farmers. At this time the civil engineering works were limited almost exclusively to works for irrigation, drainage and river improvement to protect the farm yards.

In 1868, the Tokugawa government fell and new Japan was eager to introduce western civilization. Agricultural improvement and especially reclamation, was discontinued with a few exceptions. Since that time our material civilization has progressed and as a matter of course, our farmers' standard of living has improved gradually, but not in proportion to their productive ability.

Not long after this, the problems of agricultural reformation were brought forward by the villagers and politicians. The farm adjustment law was put in force in 1899, as one of the results of a national demand. At first, the principal purposes of this law were to arrange the farm segments or lots regularly and rectangularly, to provide for the respective classes of farm roads, and to distribute the improved farms among the owners under official supervision. In short, it seemed as if these two objects, the increasing of the net area of farm lands and the saving of agricultural labour, were all expected by this law.

Our engineers who were managing the works devoted themselves to obtaining complete knowledge of agriculture, but serious troubles arose in the several districts, people protesting against decrease in yield, especially of rice and other cereals, as a result of the surface soils and subsoils having been mingled when the land was excavated and levelled. Now we do not hesitate to say that although many were successful in this first stage we are unable to contradict the complaints against the incompleteness of our knowledge and works.

Meanwhile, practical investigation of the works progressed and many young engineers who were educated along the lines of both civil engineering and agriculture were sent to every prefecture to help in the practical work. They examined all farms and found large areas unproductive owing to lack of irrigation water or because of marshy conditions from stagnant water. As a result diverting canal excavation, the construction of weirs and reservoirs, the underdraining of ground water, and the construction of centrifugal pumping plants were begun throughout the country. Thus the object of the land and adjustment law was more fully attained.

In 1909, under an amendment to the law, the reclamation works aimed to turn the grass land, wool land, and water plains into cultivated lands, and the non-irrigated farm yards into irrigated rice fields. Thus, under the law, the works were divided into important branches. One was the improvement of the land already under cultivation, and the other the enlargement of the cultivated lands, especially the irrigated rice fields.

The reclamation work for the waste lands was easy and convenient, and some projects had a satisfactory water supply. About twenty to thirty thousand acres were reclaimed annually even during the world war, the work progressing rapidly owing to the rise of corn prices.

This enlargement of the cultivated area, however, was almost equalled by the decrease in cultivated land as a result of railway and road-building and the expansion of cities.

The ever-increasing population caused more official attention to be given to the food problems. So in 1919 a special act relating to waste-land reclamation subsidy was passed.

Under this act, anyone who undertakes to reclaim over 12 acres in a district may obtain an annual subsidy of 6 per cent. of the total amount invested in the works. This subsidy is extended for three years after the completion of the works. Hence, it is often true that the total amount received as subsidy is from 30 per cent. to 60 per cent. of the total expenses. The longer the duration of the work, the greater the total subsidy.

As newly reclaimed land requires many years for full improvement those farmers who lack sufficient capital may fail owing to the difficulties of paying the accumulated interest on their debts before they can obtain a sufficient income from the land. The act provides for subsidizing the interest on the invested capital.

As most of the districts where reclamation works are undertaken are either deserted or the number of farmers there are very few, it is necessary to bring in new settlers to cultivate the new lands. But these settlers in general are so poor that they are unable to afford barns and living houses. Hence prefectoral and governmental subsidies are given to them, the rate always being more than 50 per cent. of the cost of each building.

The women especially are skilled rice planters, that is they gather the young rice by handfuls from the prepared beds and plant it stalk by stalk, just so many inches apart in the big fields, then tend it carefully until ready for the reaping.

The work under the supervision of the farm adjustment law with the supplemental encouragement of the acts above-mentioned grew so complicated that the original purpose of the law became only a part of the present law. And considering the present rise in wages of agricultural labour, we must approve the great contribution to agriculture, if the labour on farm land were saved, though formerly it was thought that this would have no effect other than to make the farmers lazy.

Under this point of view, the work of the regular arrangement of the farm lots must not cease, as it is an essential and useful work.

As amended several times, the farm adjustment law served to help every branch of land improvement and reclamation, though we must recognize the complexities of official procedure, especially when many land owners organized a farm adjustment corporation.

We must also recognize the fact that some areas of cultivated land may be improved by simply building a reservoir as the source of water by the excavation of a main canal, or by repairing diversion weirs, without the regulation of farm lots or relevelling of the surface. For this reason, in 1923 another act was passed. Under this act every principal work of improvement relating to areas of more than 1,250 acres of farms in the worst condition, either waterless or too wet, may be subsidized by the government to the extent of 50 per cent. of the expenses. Referring again to the reclamation, some good results were obtained through the efforts of the men engaged on the works, and under the encouragement of the various laws; but these results did not always meet the food demands caused by the increase of population. Small areas of waste lands may be reclaimed under present conditions, but larger ones, say of more than a thousand acres, can hardly be brought into cultivation, owing to the many difficulties. For instance, thousands of land owners may not agree on the utilization of the land, because the expense of the work may aggregate a large amount, although really not so large per unit of area. Furthermore, the industrial or agricultural banks will not loan all the funds needed at once.

Women transplanting the tiny rice shoots. They must often walk sometimes knee deep in the slime and water that covers the rice field, for some two weeks, after the planting, for rice is a water plant and needs constant care.

How the Japanese workers stack the rice straw of home and on the island of Formosa. Men and women work side by side and it is often on affair of the entire family, but the work is done efficiently and with an artistic effect.

In view of this condition our government has decided to draw up definite plans for the reclamation of larger areas of land. The 52 Imperial Diet this year approved the budget including the provisions for reclamation and we are now looking forward to the coming year when we are confident the Diet will approve a definite bill that will provide funds for carrying out projects in reclamation.

The following table shows by years the adjusted and reclaimed areas and the areas for which main works will be constructed.

Column A, Areas improved and reclaimed under the Management of Land Adjustment Law.
Column B, Reclaimed areas, after Act of Waste Land Reclamation Subsidy was enacted.
Column C, Areas for which main works are now under construction. (Some of the work finished.)

Year	A Acres	B Acres	C Acres
1899	2,027	—	—
1900	—	—	—
1901	5,561	—	—
1902	8,086	—	—
1903	13,534	—	—
1904	19,198	—	—
1905	24,601	—	—
1906	80,942	—	—
1907	59,302	—	—
1908	61,623	—	—
1909	91,243	—	—
1910	99,641	—	—
1911	140,464	—	—
1912	29,410	—	—
1913	91,001	—	—
1914	109,810	—	—
1915	92,312	—	—
1916	69,880	—	—
1917	64,902	—	—
1919	79,697	46,851	—
1920	96,263	23,985	—
1921	80,207	34,370	—
1922	78,689	17,578	—
1923	92,591	1,399	45,745
1924	105,753	21,597	57,942
1925	112,158	17,151	40,839
1926	—	12,628	68,476
Total	1,772,688	175,559	213,002

In those localities facing south and seaward much rain falls in the summer, owing to the influence of the summer wind which blows over the Pacific ocean. On the other hand in the northern half of Japan there is much precipitation in winter, as a result of the cold winds that sweep in from across the north Japan sea. As the average annual precipitation on the island is more than 1,700 mm. (or 70 inches) our country is more suited to irrigation than to land drainage, as to which we very often meet with much difficulty in the lower alluvial regions.

All the rivers in Japan flow from the mountainous regions which extend from east to west, forming the central axis of the island. These rivers flow north or south from these ranges. There are few rivers longer than 200 miles.

The limited area of watershed, which is a tertiary or diluvium deposit, is a junction between a steep mountain and in a plain, with a sudden change from a mountain to a plain or of an erosion valley to a lower deposit of alluvium. As a natural result, the velocity of the floods is very rapid. Therefore all farm protection work, including the maintenance of dams and levees which surround the lower fields, the lining of the river and canal banks, and the several kinds of structures for water supplies meet with great difficulty and expense.

The old works managed by the feudal lords were designed generally on a small scale without systematic plan, so that we often encounter much trouble when we desire to increase the water supply for these lands.

Owing to the incompleteness of these old works, the farmers' interests also differ to a small extent; so that it is difficult to make them recognize the necessity of farm improvement on a large scale.

A Close-up of a Woman Planting Each Stick of Rice in the Water-covered Soil.

The greater difficulties are met in those cases where we wish to construct new water works for reclamation to supplement the original water supply systems. Also we encounter frequent difficulties and conflicts when we begin to provide new sources of water for reclamation in conjunction with the power works used at present or to be used in the future. This leads us to anticipate the necessity of a special water law for the future.

These difficulties are, of course, greater in those localities where land utilization is more intensive. Then, also, the enactment of water laws is not such an easy matter. In the development of power and an agricultural water supply, we are guided by many articles, especially by those in the proceedings of the American Society of Civil Engineers.

We bear in mind two essential problems when we are dealing with practical reclamation. One is to distribute the irrigation water to every farm according, more or less, to the duty of water; the other is how to increase the duty of water without any negative effect on crops. The latter may include such problems as how to restrict percolation of water into rice farms, as the lands to be reclaimed in the future are composed largely of either volcanic, light humic, or diluvium earth into which an abnormal amount of percolation is expected. Other difficulties for reclamation are on the economic side. As most of the Japanese lands to be cultivated in the future are located on steep slopes, the cost of providing a water supply will rise often to more than $500 per acre. This high cost, although it may be reduced by mechanical advantages, is being balanced at present only by the intensive utilization of the land.

Who's Looney Now

THE propagandists, who have steadily been insisting that there is no Communism in China, have steadily been repudiated by the Nationalist Government. The Americans who have been praising the Soviet policy in China in contra-distinction to the American policy have now received an intellectual and moral-blow from which they cannot recover. The Nanking Government has not only denounced Soviet Russia, they have broken off relations and have handed his passports to the Russian Consul-General in Shanghai. The following official despatch speaks for itself:

(Kou Min News Agency)

In a mandate dated 14th December, the Nationalist Government ordered that recognition accorded to the Consuls of the Union of Soviet Socialist Republics stationed in various provinces under the jurisdiction of the Nationalist Government shall be withdrawn and that the Soviet State Commercial Agencies in the various provinces shall also suspend their functions. The Ministry of Foreign Affairs is instructed to superintend its subordinate organs and to act in conjunction with the other government authorities concerned to put into execution this mandate with due care and vigilance.

This momentous step was forced by the startling event which occurred in Canton on the 11th of the current month, when the communists took forcible occupation of the city, followed by an orgy of plunder, massacre and incendiarism. It was discovered that this rising was made possible because the Soviet Consulate and the Soviet State Commercial Agencies were actually accomplices of the communists, having long since permitted the use of their premises as base for communist operation. Not considering the material damages consequent to such armed disturbances, but, the fact itself, that the quarters of diplomatic representatives, enjoying as they do such rights of immunity, should be used as headquarters of red propaganda and asylum for communists, to a most flagrant violation of international ethics.

The Government is in receipt of various reports to the effect that risings of a similar nature as the one which occurred in Canton have been planned to take place in other important districts within the Nationalist jurisdiction, incidental to an elaborate program of the Communist Party for the destruction of the Kuomintang and the Nationalist Government. The Party and the Government are determined to stamp out the communists, whose presence has always been a source fraught with incalculable dangers, with all the resources at their disposal, of which the execution of this mandate must be considered as a substantial step forward.

Following is a translation of the mandate of the Nationalist Government:

The Nationalist Government has, for sometime, been informed by various reports that the Soviet Consulates and the Soviet State Commercial Agencies in areas within the jurisdiction of the Nationalist Government have been used as headquarters of red propaganda and asylum for Communists. An exposure of these facts has been so far withheld by the Government in view of the international relations existing between China and Russia.

On the 11th of the present month, a rising took place in the city of Canton culminating in the forcible occupation of the city by the Communists who cut off all communications and burnt, plundered, and massacred throughout the city. This startling event with all its disastrous consequences is mainly attributed to the fact that the Communists have availed themselves of the Soviet Consulate and the Soviet State Commercial Agencies as a base to direct their operations. And the fear is entertained that occurrences of like nature may take place elsewhere.

With a view to maintaining peace and order and to preventing the further spreading of such disasters, the Government feels that such a state of things, fraught with incalculable dangers to the Party and State, can no longer be tolerated. Therefore it is hereby ordered that the recognition accorded to the Consuls of the Union of Soviet Socialist Republics stationed in the various provinces shall suspend their functions, in order that the root of evil influence may be eradicated and a thorough enquiry instituted. The Ministry of Foreign Affairs is instructed to superintend its subordinate organs and to act in conjunction with the other government authorities concerned to put into execution this Mandate with all due care and to report thereon.—14th December, 1927.

Remarkable Glass Bottle Making Machines

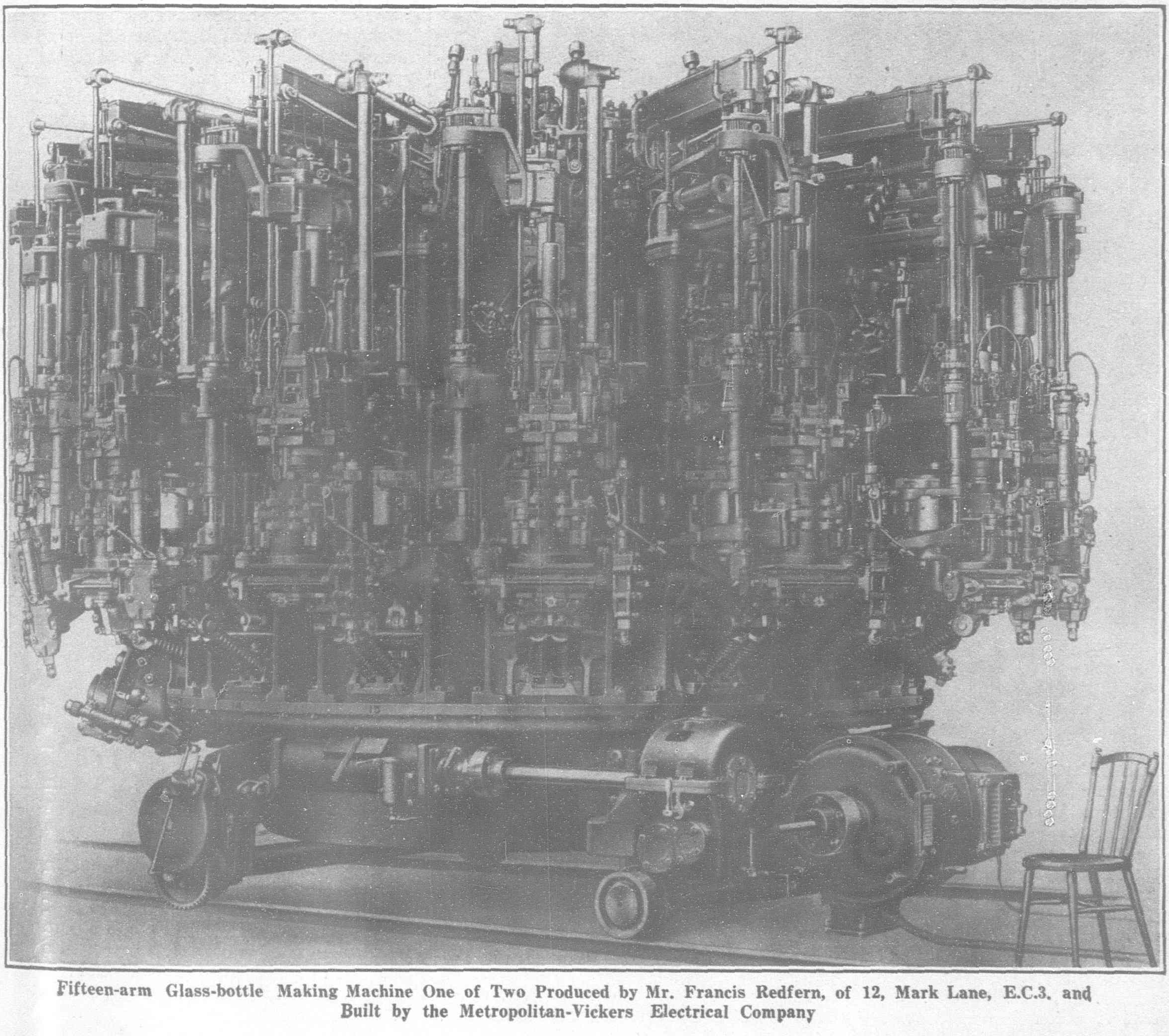
To Make a Million Bottles a Week

A REMARKABLE piece of engineering work, and one very unusual for an electrical manufacturing company, has just been completed by the Metropolitan-Vickers Electrical Company, in the construction of two large and highly complicated machines for making glass bottles. The construction of the machines is a sequel to the production of a smaller machine of similar type, built in the Metropolitan Vickers works in 1920. All three machines are the outcome of the vision, energy and indomitable courage of Mr. Francis Redfern, of 12 Mark Lane, E. C. 3.

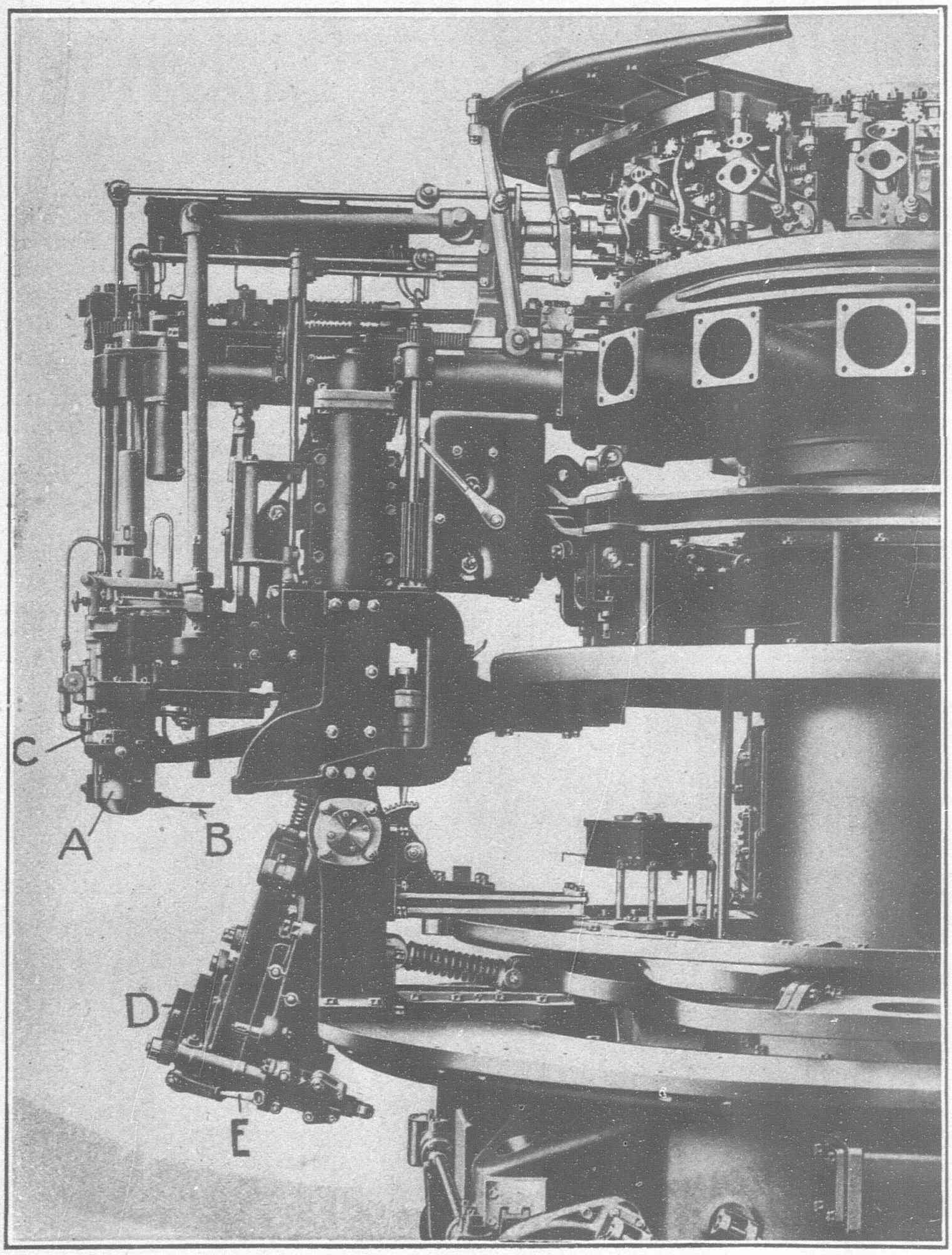
The story of this development is almost as remarkable as the machines themselves. Prior to 1920 the supply of bottle-making machinery was almost a complete American monopoly, and even now no specially-equipped factory exists in England for the manufacture of such machinery. Mr. Redfern is a solicitor by profession and had had no previous experience of machine construction, and it was primarily in order to meet the needs of Messrs. John Walker Sons, Ltd., of which firm he is a director, that he approached the problem which he has solved with such conspicuous success. With the assistance of Mr. R. F. Nail as engineer, Mr. Sydney Hunt as designer and the Metropolitan-Vickers Company as constructors, he succeeded in producing a machine capable of making better bottles and making them more cheaply than the best American equipment.

The first model, a ten-unit machine was installed in 1920 in the Castleford works of John Lumb & Co., Ltd., a subsidiary undertaking of John Walker & Sons Ltd., and has been making bottles successfully in almost continuously night and day operation since that date. The two new machines, one of which is shown in Fig. 1 are of improved design and greater capacity. They are being supplied for the Mitsubishi Shoji Kaisha of Japan.

In general appearance the machines resemble a merry-go-round, about 17 feet in diameter and about 15 feet in height. One will look in vain for the horses or gondolas on this round about but in their place, revolving about the central column are fifteen units each of which constitutes virtually a complete and separate bottle-



Fifteen-arm Glass-bottle Making Machine One of Two Produced by Mr. Francis Redfern, of 12, Mark Lane, E.C.3. and Built by the Metropolitan-Vickers Electrical Company



One Unit of Machine with Table Lowered

making machine. The circle of units is rotated alongside a pot of molten glass. As each unit passes the pot it takes up a sufficient quantity of glass to make a bottle and each unit makes one bottle-per revolution when single moulds are used. At the maximum speed of 6 r.p.m., and using single moulds, each machine can thus produce 90 large bottles per minute and maintain an output of over 500 bottles per hour. With dual and triple moulds smaller bottles can be produced at correspondingly greater rates.

According to the moulds and adjustments used in the different units, the bottles may range from $2\frac{1}{2}$ to 16 inches in diameter. With the present equipment bottles of fifteen different shapes and ten different capacities may be manufactured simultaneously by each machine.

Each machine is driven as a single unit by a 15 h.p. variable speed motor operating through a 2-speed gear-box and worm-gearing on the rotating base or foundation ring. The speed can be varied from $1\frac{1}{2}$ to 6 r.p.m. The drive to the operating parts of each arm is transmitted mainly through cams and levers, the operation of the whole machine being, apart from the main drive, entirely automatic.

Figures 2 and 3 show a single unit in side and front view respectively. The process of bottle-making is indicated by the following brief statement of the cycles of operations of one unit.

The embryo bottle is first produced as an almost solid blank or "parison" of plastic glass. The blank is formed in a divided mould *A* which is carried under the upper part or head of the machine. The head as it passes the tank of molten glass dips the open bottom of the mould into the material, the charge of glass being drawn up into the mould by vacuum applied at the same time. As the head rises the trailing glass from the lower part of the mould is cut away by a knife *B*. The blank thus produced, while smaller than the finished bottle conforms in general to the finished shape. The neck part is already finished having the familiar thick collar or ring which serves to straigthen the mouth of the finished bottle and incidentally facilitates the handling of the bottle in the course of manufacture. The neck has also been hollowed by a plug which projects into the mould at the top, the cavity thus formed being enlarged by a puff of compressed air as the plug is withdrawn. As the head passes clear of the tank the blank mould divides, leaving the glowing and plastic parison suspended by the upper mould *C* which has formed the neck.

Another divided mould *D*, representing the finished shape of the bottle then rises from below and closes upon the hanging blank, and a further supply of compressed air blows out the blank to its final shape in the mould. The neck ring now opens, and as the machine is by this time completing its revolution, the finishing mould, carrying the bottle, swings down to clear the pot containing the glass where the next charge is being taken by the blank mould above. The finished bottle is then released by the mould, held a moment by a swinging arc *E* while the mould is opening, and ejected into a chute just in time for the finishing mould to take the next blank. So the process is repeated continuously at each head.

All the important bearings of the machine are of the Timken tapered roller or ball type, enclosed in dirt-proof housings. They carry sufficient grease for a long period and are replenished with a grease-gun when necessary. Back and pinion mechanisms and sliding parts are supplied with oil by gravity fed from a tank mounted on each arm. This supply, which is separately controlled on eight pipes for each unit, is sufficient for normal requirements but convenient oil caps are provided for hand lubrication if required.

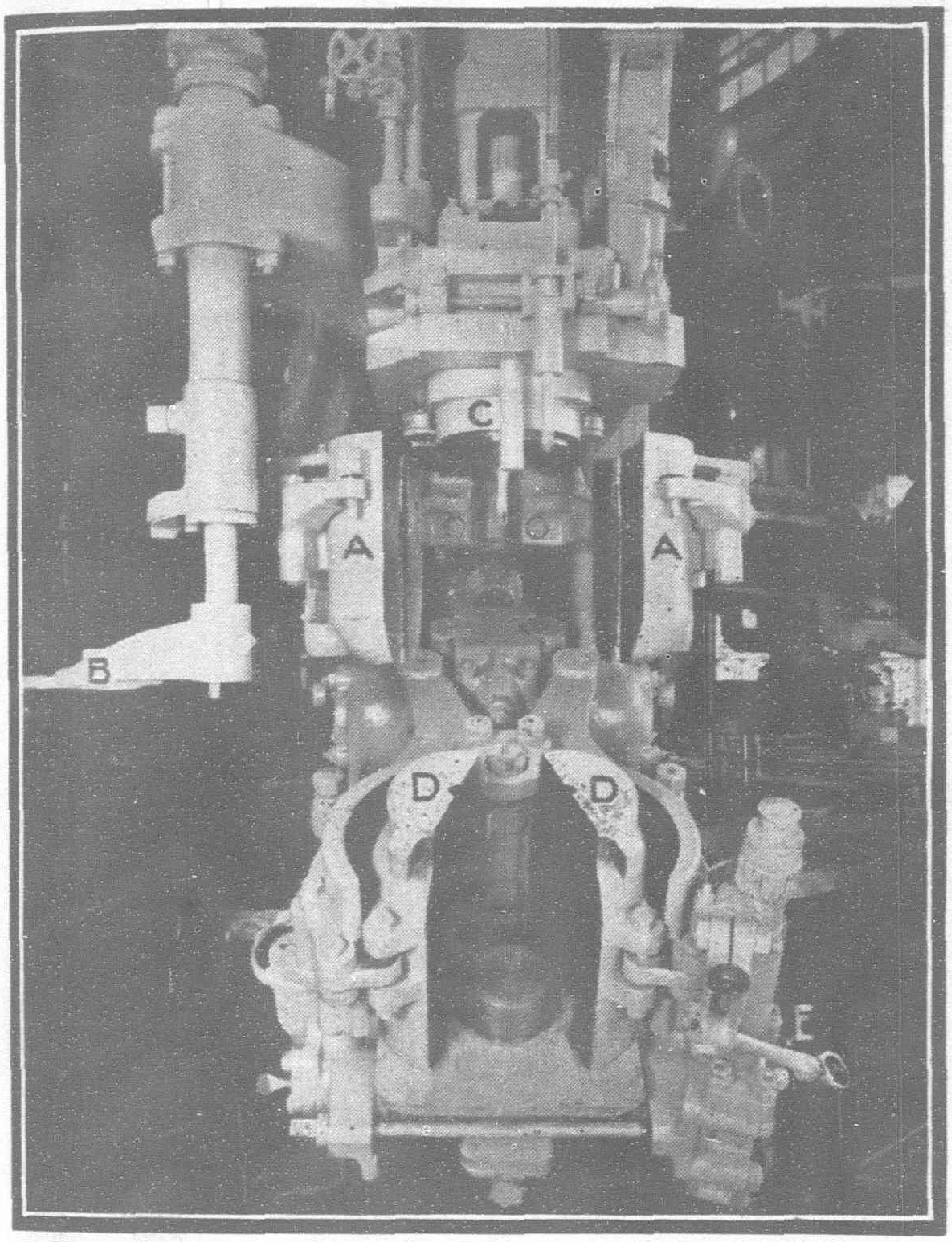
The machine can be traversed to or from the pot either by motor or by hand-gear. It can be raised or lowered to suit different levels of glass in the pot by means of a $2\frac{1}{2}$ h.p. motor fitted for this purpose.

A notable and interesting feature of the construction is that the operating force is transmitted to the various parts of such unit through springs which are of much strength that they will transmit the force necessary for all ordinary operation without appreciable collapse but will yield to accommodate any obstruction. All the component parts of the machines are interchangeable, either individually or in combination and in the event of a serious breakage ever occurring, any unit may be taken out and replaced by another, perfectly adjusted in every respect and the machine put back into commission in 30 minutes.

A test replacement of this kind, except that the conditions were easier in that the machine was not making bottles, was actually carried out in the Metropolitan-Vickers works in 21 minutes.

A week's production of merchantable reported quart bottles from one machine is estimated at over 400,000. The design of the 15-arm machine is a great advance on that of the 10-arm machine, but the latter, first of its kind ever made has produced 241,632 merchantable quart bottles in a week. These are square quart bottles and the corresponding number of round quart bottles would be in excess of this number. The Castleford machine has produced 294,048 merchantable square pint bottles in a week, working with single moulds. On the basis of the Castleford experience it is estimated that each of the new machines is capable of turning out with dual moulds 120 pint bottles a minute, or over one million a week, and it is believed that each of the new machines is capable of making a range of ware equal to that of any other suction automatic machine in existence.

The construction of such machinery as this is an undertaking which requires the very finest machine tool equipment, and the highest standard of quality in materials and workmanship. Some idea of the difficulties will be appreciated when it is pointed out that not only has each machine to carry its own rotating weight of about 40 tons with absolute rigidity so as to ensure accurate registration of moulds and other operating parts, but it has to maintain its accuracy under severe conditions of heat, dirt, carbonized oil and particles of glass in continuous night and day operation. That the Metropolitan-Vickers Electrical Company should have been requested to undertake the work of construction to meet these conditions is a great compliment to the works equipment and the reputation of the firm, while the successful completion of the work is proof that the confidence of the designer has not been misplaced.



Front View of One Unit, with Table Lowered and Moulds Open

Japanese Plan Rayon Mills in China

In view of the possibilities of increased consumption of RAYON in China some of the Japanese spinning interests in China are planning the erection of Rayon plants.

Reliable figures of imports in China are not obtainable, but it is generally believed that this class of import is steadily increasing. The principal suppliers are Italy, France, then in order of importance, Germany, Holland, and England, with Japan's contribution negligible as yet.

Companies said to be taking the lead in this new move toward Chinese business are the Kanegafuchi Boseki K. K., Dai Nihon Boseki K. K., and others of lesser importance now established in the Chinese field.

Out of Kimono into Overall

(Continued from page 544).

In the earliest days of pearl culture the oysters were spread on the bed of the ocean and women divers employed to bring them to the surface in baskets. Parasites, crabs and other oyster enemies made such serious inroads on the production that a cage was devised for their production. A further advance was made when for protection of the oysters from its natural enemies the cages were lifted a few feet off the bottom and means of suspension from the surface was invented. By empirical methods of cut and try it was finally determined that a staggered arrangement of cages in groups at a mean depth of 15 feet below the surface was the ideal for feeding and growth of the oysters and consequently resulted in maximum production of pearls.

As a fitting remembrance of my visit after inspection of the station I was invited to the villa of Mr. Mikimoto, situated on a hill overlooking the station, where after the inevitable cup of Japan green tea I was presented with a tub containing some 25 to 30 pearl oysters dripping with sea water which I was told were of the sixth year cultivation variety and had been taken from the cages a half hour before. I was asked to open the oysters and try my luck and with the skillful assistance of the Manager of the station who deftly laid the oysters open with a scalpel I was rewarded with four beautiful specimens of cultured pearls, all perfectly spherical and with one exception of good color. The products of scientific research in fisheries technology impressed me as being ample proof of the blending of the fruits of research with the inherent artistry of Japan in the production of an article of commerce which brings something of the beauty of its environment of its native land to the marts of trade.

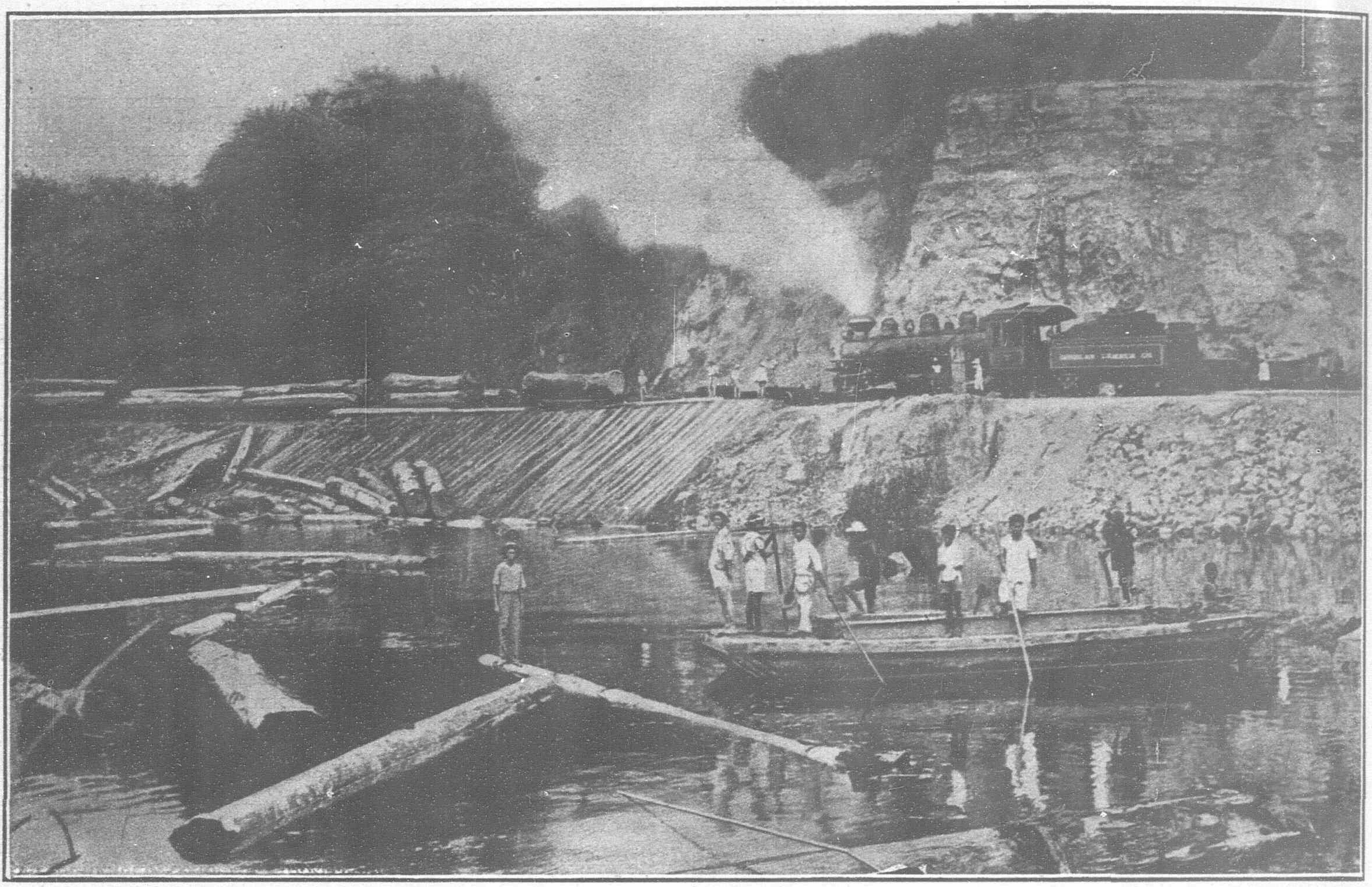
In connection with the study of cultured pearls in Japan I learned that a famous gem expert, retained by one of the largest jewelery companies in America, had endeavored to devise means to detect the difference between cultured and natural pearls. In spite of scientific devices which were developed, including x-ray examination, technical experts reported that no method developed to date assured definite identification. With the insertion in the anatomy of the oyster of a perfectly spherical nucleus of mussel shell the processes of nature were duplicated in Japanese pearl culture—they are products of identical processes and conditions.

(To be Continued).

Berlin to Peking Air Service

WAITING only for the clearing of the political situation in China to commence business, the Deutsche Lufthansa has perfected its plans for the inauguration of a direct air service between Berlin and Peking. "We are all ready to start a service right through to the Orient," declared Dr. Otto Merkel, in a recent interview. At a speed of 100 miles an hour the passage from Berlin to Peking is theoretically possible in two and a half days, but for the present the German plans are to fly only in the daytime, which means five days to make the trip. The trans-Siberian express trains, twice a week, make the trip between Germany and Peking in 11 days. The Suez route takes 40 days and *via* Canada or America, the time is 21 days. The majority of passengers on the trans-Siberian express are German business men traveling back and forth between China and their homeland, and the inauguration of a direct air-service will give them exceptional advantages over their competitors of other nations in developing their trade with the Orient.

Dr. Merkel declares that economically and technically nothing stands in the way of an immediate inauguration of the service. "We have only the political situation in China to overcome. The Soviet Union is co-operating with us in every way, but we cannot run an air-service to China until there is some government ready to guarantee a permanent franchise or at least a franchise for twenty years. The German company are confident of finding plenty of business and rely on the mails alone to bring in large revenues.



Waiting to Unload at the Log Pond

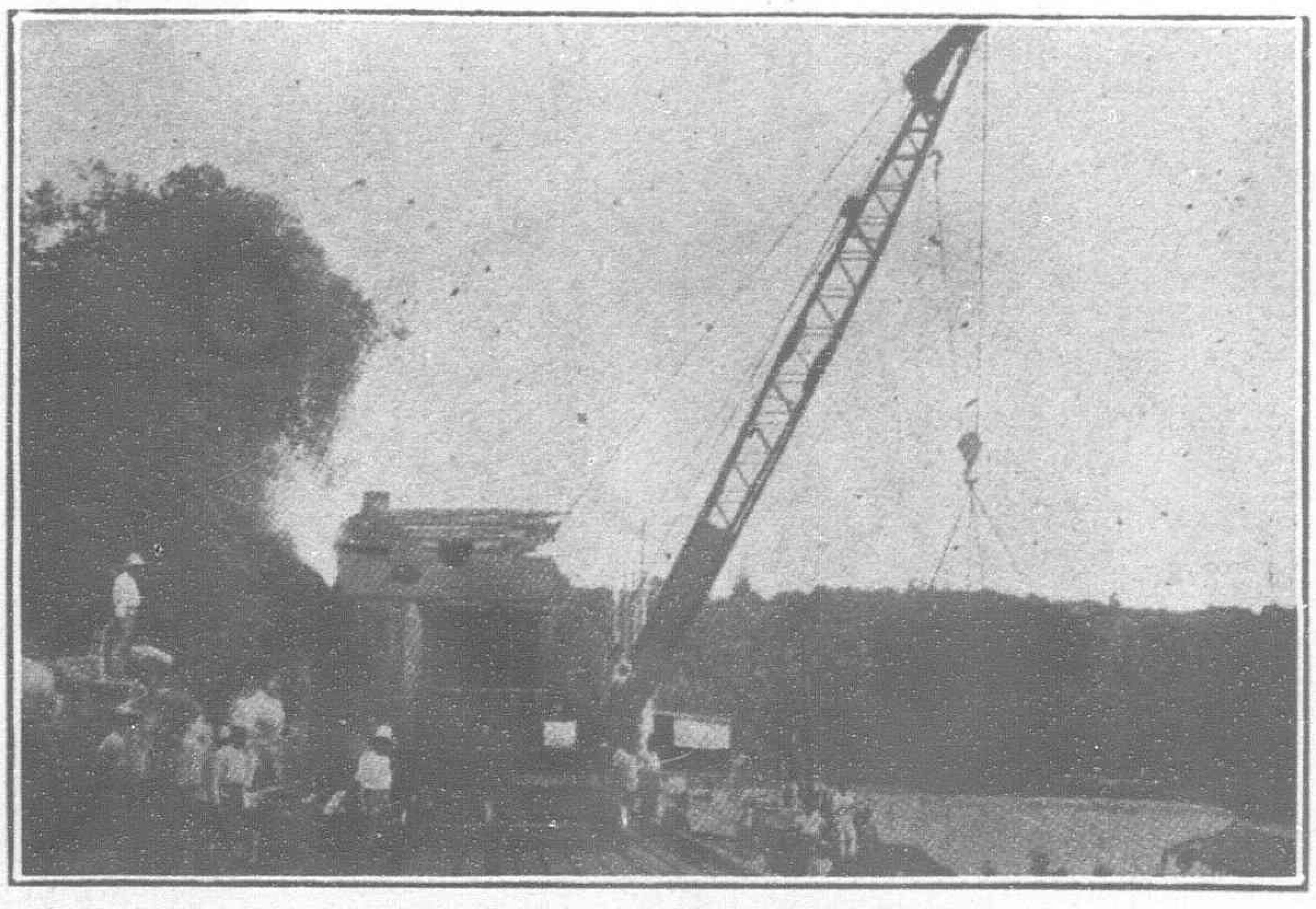
Logging in the Philippines*

By Ervin R. Edgcomb, Secretary of the Insular Lumber Company

THE Insular Lumber Company conducts the most important and extensive logging industry in the Philippines and, in fact, operates the largest hardwood mill in the world at the present time. This company was incorporated in 1904 and started in business shortly thereafter with a small circular saw mill situated at Fabrica, Occidental Negros, P.I. This mill has gradually been increased in size, and capacity, to such an extent that the production in 1926 was over 50,000,000 board feet of lumber and this figure will probably be even greater for the present year.

The land, on which the timber is located, is actually owned by the Philippine Government, and the Insular Lumber Company has a concession which allows them to operate over an area of 139 square miles, the Government receiving payment for the timber as it is cut. It is estimated that the timber, covered by this concession, should last for at least thirty years at the present rate of production.

About eighty-five per cent. of the lumber produced is Philippine mahogany which is marketed in all parts of the world. The demand for this wood is rapidly increasing due to its beautiful grain, its adaptability to many different uses, and also to the decreasing supplies of Central American and African mahoganies. A large quantity of this wood is shipped to the United States and used principally for boat building, interior finish in houses and office buildings, doors, flooring, furniture, cabinet work and patterns.



Loading Lighters at the Mill's Docks

The remaining fifteen per cent. of the product consists largely of a wood, known as "Apitong," which is used for building construction, automobile and railroad car frames, and a number of other purposes requiring heavy, strong, wood similar to oak.

The standing timber is quite large, averaging four to five feet in diameter, with many seven or eight-foot trees rising to a height of 100 to 125 feet. On account of the size of the timber, and the high rate of production, it is necessary to use only the best equipment throughout the various operations.

The timber is handled over the Company's 3-ft. 6-in. gauge

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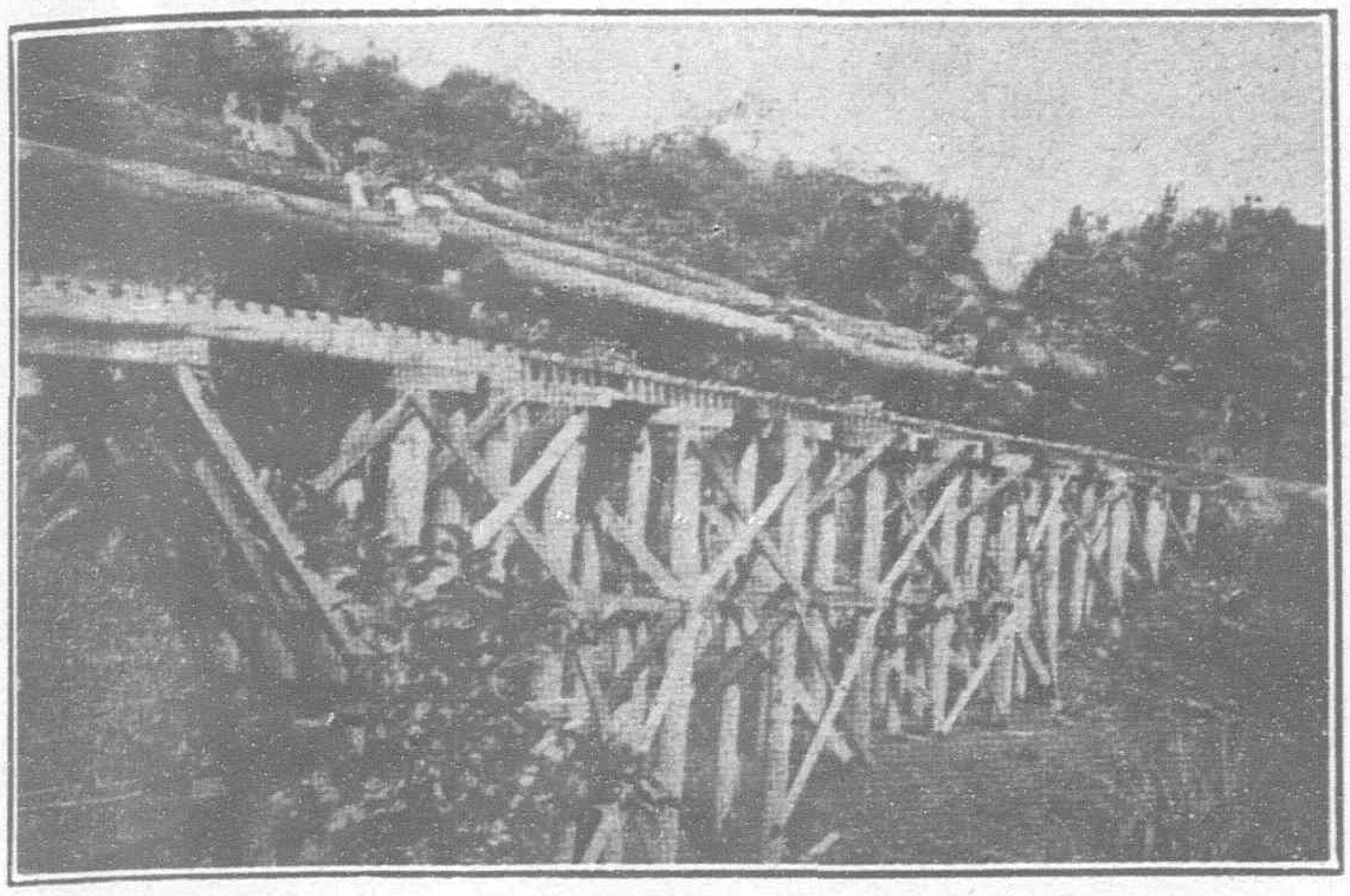
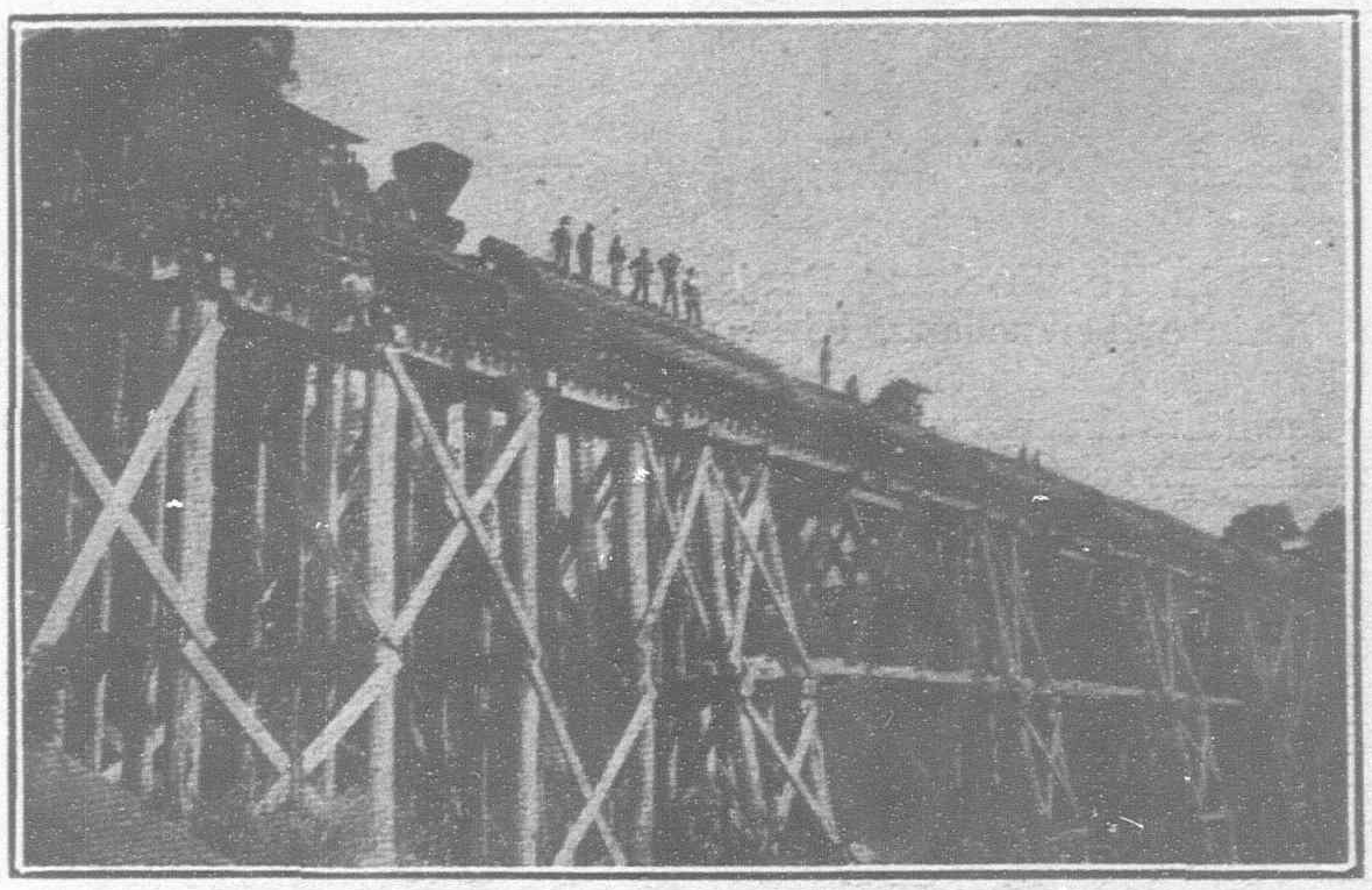
*Baldwin Locomotives.



The Baldwin 0-6-6-0 Mallet Bringing in a Train of Logs



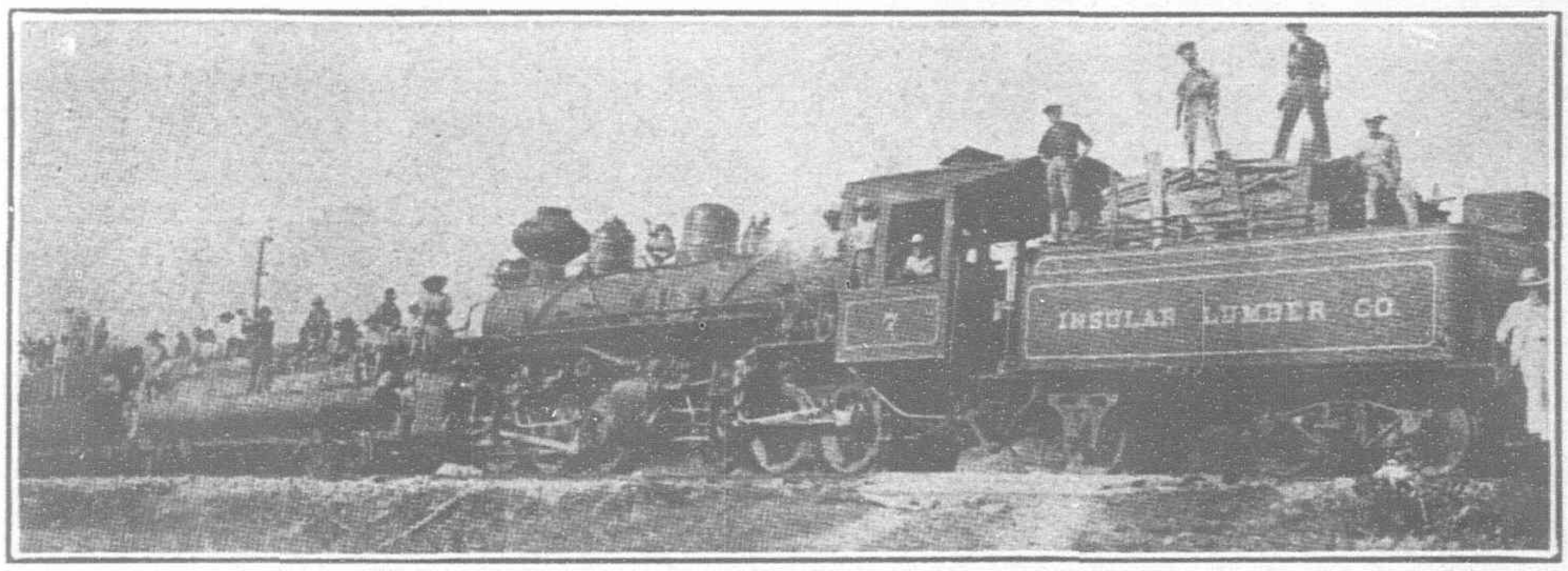
A "Shay" Locomotive with a Train on the Upper Iglamgam Bridge

railroad having fifteen miles of main line track and in addition to this, there is built every year about twenty miles of temporary tram lines. Connected logging trucks, of 60,000 pounds capacity, built by the Pacific Car and Foundry Company, are used to carry the timber. The motive power consists of: one Baldwin Mallet, five Shays and one Davenport locomotive. There are also two small switching engines used in the yard, at the mill. The Shay locomotives are used on the tram lines to bring the loaded cars to the main line, where they are picked up by the Baldwin Mallet.

The main line track is well ballasted and kept in excellent condition and the maximum grade is about five per cent. The curves have a radius of not less than 240 feet on the level sections and 300 feet on the heavier grades, but on the branch lines the curves, of course, are sharper and the grades heavier.

The mill equipment consists of three band mills, of large size, used for cutting the logs into lumber and timbers, and two band saws for resawing the thicker pieces into boards of standard width and thickness. A planing mill and a box factory are operated, in conjunction with the main saw mill, and here the smaller pieces of lumber are made into boxes, which are sold to the coconut shredding plants in Manila.

The waste from the various mills is put through a crusher known as a "hog" which grinds the wood up into small pieces for use as fuel, in the stationary boilers.



The Baldwin Mallet on the Main Line

Part of the slabs are saved and cut to the proper sizes for use in the boilers of the locomotives, which are operated almost entirely on wood fuel.

Fabrica, where the mill is located, is about eight miles from the mouth of the Himogaan River and the lumber is loaded in steel barges, holding 225,000 to 300,000 feet each, and these are towed down the river by a small steam tug. They are than picked up by a larger seagoing tug and towed to Iloilo or Manila where the lumber is loaded on steamers for shipment to all parts of the world.

The Company employs about 3,000 men at the mill, in the woods, and on the railroad and as a result the total population of the town of Fabrica numbers about ten thousand. Most of these are Filipinos but a few Chinese and about twenty-five American executives are included. The Filipino labor is rather inefficient but peaceable and, with good superintendents, proves quite satisfactory.

The climate is healthful and the Americans in general are contented at Fabrica. The management puts forth a special effort to make life attractive by maintaining an ice and cold storage plant, a moving picture theatre, a club house and a dance hall for the benefit of their employees.

It will be seen from the foregoing remarks that the Insular Lumber Company is more than a producer of timber and has become, in fact, one of the institutions of which the Philippine Islands may be justly proud.

China International Famine Relief Commission

(Continued from page 561).

is possible should a new committee for Kwangtung be formed this year. As yet the problem of famine prevention for this province has had but little consideration by our Commission, no Committee being in the field there.

Future Work

Looking forward into 1927, we see rapid strides being made in road construction in Yunnan and Kweichow and perhaps Szechuen. The new engineers going into those provinces will maintain the standards desired and keep up the necessary enthusiasm for better roads. It is very possible that the road building fever will also strike Hupeh and Kiangsi where there has been considerable discussion of the problem. The first work of a famine prevention nature in these last two named provinces, however, is the reconstruction and improvement of the Han and Yangtze River dikes. This will use our best talent between now and summer. The work of constructing the Shih Lu Irrigation project will go ahead this coming spring and should be completed by summer. In Shantung an experimental plant for siphoning water at flood time from the Yellow River and storing it in near-by settling ponds for irrigation purposes, is on the 1927 program. Funds have been set aside for this purpose. Projects in other provinces will be launched as soon as civil war closes, so that works of a public nature can go ahead. In certain regions the work will proceed, war or no war.

In discussing the work of the coming year, it should be noted that unit costs are likely to be considerably higher than in preceeding years. There is a decided tendency upwards in all wages in China at present. Just how that will effect common labor in the country cannot now be stated definitely. But measured in dollars it is safe to say that dike and road projects will cost more per fong than in the past. This does not mean there will be a diminished efficiency in the labor under our engineers.

Engineering Notes

Kirin To Wuchang Project.—Members of the local gentry at Kirin and Wuchang, Kirin province, are planning to build a railway from Kirin city to Wuchang, a distance of about 400 *li*, to facilitate the movement of agricultural produce. The project is awaiting the authorization of the Kirin authorities.

Ssupingkai-Taonan Line.—The Ssupingkai-Taonan Railway is constructing its own terminal station at Ssupingkai, with an engine she west of the Railway Town at a cost of about Yen 2,000,000. Heretofore the S.M.R. Co. Suspingkai Station has been used in common. When the new station is ready, the Railway Town of Ssupingkai will be enveloped by the Chinese Town on the east, north and west.

Taolu-Takata Light Rail Extension.—The Kaiyuan-Taolu Light Rail Line Co. (Manchuria) propose to extend the line by about 40 kilometers from Taolu (Hsifeng) to Takata (Hsian). On the 20th inst., the Directors will be called to an extraordinary session to agree on some workable plan. The extension costs are estimated at $700,000. The work will be put in hand next spring, to be finished by the following October.

Sinminfu-Mukden Section of Peking-Mukden Rly.—The Japanese loan of Y.320,000 contracted 18 years ago in connection with the Sinminfu-Mukden Railway (which is now a section of the Peking-Mukden Railway) has been fully repaid. The loan was contracted with the South Manchuria Railway Co. at 5 per cent. per annum interest, the last instalment of principal and interest having been paid by the Peking-Mukden Railway Administration on September 13 last.

Taonan-Tsitsihar Railway.—The Chinese Eastern Railway Administration, which at first strongly opposed the extension of the Taonanfu-Tsitsihar Railway from Angangki to Tsitsihar, has now withdrawn its opposition on the condition that a viaduct shall be built across the C.E.R. Construction of the additional mileage will soon be undertaken and is expected to be completed next spring. Before the construction of the viaduct there will be a motor service between Angangki and Tsitsihar.

To Double-track Peking-Mukden Railway.—The authorities of the Peking-Mukden Railway Administration are planning to double-track the line in order to facilitate traffic. Work on the whole line is to be completed by three stages, starting with the Mukden-Chinchow section, then the Chinchow-Tientsin section and finally the Tienstin-Peking section. The section of the line between Tongshan and Chinwangtao has already been double-tracked with a loan provided by the British and Chinese Corporation.

Kaitung-Fuyu Project.—The Chinese authorities who are planning to build a railway between Kaitung on the Ssupingkai-Taonan Line to Fuyu (Petune) on the Sungari have caused a surveying party of 7 sent out by the Ssupingkai-Taonan Line Office under Chief Engineer Nieh. The new route to be surveyed is 80 miles long and the surveying operations will require about a month's time to finish. Fuyu, the proposed terminus, is situated near the confluence where the two Sungaries join each other to become the Nen river, flowing near Tsitsihar. Fuyu is in the midst of a very rich country which is already growing a large amount of staple produce.

New Chichibu Cement Company Formed.—The Chichibu Cement Company has adopted a plan to establish the Second Chichibu Cement Company, capitalized at Y.7,000,000 in 140,000 shares. The first instalment of a quarter will be finished till October 20. This company is to be merged to the Chichibu Cement Company in course of next month. Money thus to be raised will be devoted to the payment of loan to the Mitsui Trust Company. The proposed plan to increase the cement production from 70,000 to 140,000 barrels has been laid aside, in view of the economic depression.

Through Shanghai-Nanking Telephone Service.—The long distance telephone system between Shanghai and Wusih is already in operation, while the section between Wusih and Nanking is nearing completion. The whole line is expected to be opened for through service early in November.

Kirin-Tunhua Railway.—The Kirin-Liutaohotzu section of the new railway being built from Kirin to Tunhua was opened to provisional traffic on October 15. The journey will take about three hours. Work on the Taoyehling tunnel is progressing and is expected to be completed about the end of October. The tunnel will be 1,820 meters long. The country traversed by the railway is regarded as suitable for rice farming on a large scale.

New Bridge at Tientsin.—A new bridge of the Scherzer type was opened at Tienstin on October 18. It crosses the Haiho near the old bridge, and has a width of 58 feet for traffic against 28 feet on the old bridge. There are special passages for ricshas. There is a free opening for river traffic of 140 feet as against 57 in the old bridge. The mobile span is worked by four electric motors of 65 h.p. each.

Tientsin-Sintsi Motor Bus Service.—The Hwa Tung Hsi Chi Motor Bus Company maintains a daily bus service between Tientsin and Sintsi, which leaves the former city at 6 a.m. at Santiaoshih, Hopei. It passes through Changhsien, Shenhsien and a number of large villages, and the fare is as follows :—Tientsin to Changhsien $2.60 ; to Tsuichwang $4.00 ; to Hwaichen $5.50 ; to Siaofan $7.00 ; to Shenhsien $9.00 ; to Kiucheng $10.00 ; to Luitow $11.00 ; to Sintsi also $11.00.

New Collieries in Hsi-an Prefecture.—A few coal mines having been discovered in Hsi-an Prefecture in the Tungshan (Eastern Hill) District, Manchuria, Generalissimo Chang Tso-lin sent an official of the name of Shou To-shan to that Prefecture last spring to look over the ground and report. At the same time, the Hsi-an Coal Mining Co. has been founded with Mr. Shou for Manager. The capital is $6,000,000. On October 5, Civil Governor Mo, Manager Ying of the Mukden Arsenal, Director Wang of the Mukden-Hailungcheng Line, Chairman Ting of the General Guild, Mukden, came together to agree upon the allocation of the capital money. By this plan, the Government will subscribe $3,000,000. $1,000,000 to be raised between the Mukden Arsenal and the Railway management, and the remaining $2,000,000 among the gentry.—*Manchuria Daily News.*

Mill for Unemployed.—To give employment to the workmen who have been thrown out in consequence of the recent labor unrest in the province, Chekiang authorities have voted $100,000 to establish a cotton weaving mill to be known as the "Chekiang Provincial Government Mill." The mill will have a number of works, of which two will be started immediately. A number of weaving machines owned by some of the defunct silk weaving factories will be purchased and converted into cotton weaving machines. Ten thousand dollars have been ear-marked for the repairs and improvements of the premises of the two works, $80,000, for the purchase of raw materials, and $10,000, for other items of overhead expenses. The two works are expected to be opened sometime this autumn, if no unforeseen circumstances intervene.

Tokyo Ishikawajima Zosenjo.—(Ishikawajima Shipbuilding Works). During the present term the Tokyo Ishikawajima Zosenjo is at work on a 2,000 ton destroyer of the first class which is to be completed before the end of the year. Construction work on a special service ship of 1,600 tons for the Navy Department will be started some time next month. The machinery and steel material mills are fairly busy with orders for bridge materials for Tokyo City and the Department ol Railways and work is also under way on turbines for destroyer propulsion which is one of the specialties of the company. Other orders include two radio towers 750 feet (?) high for the Japan Radio Company. The automobile department is also kept busy with enough orders.

Changchun Kwanchengtzu Cart Road.—The Chinese Eastern Railway is constructing a cart road from the eastern end of the Changchun Station property to Kwanchengtzu and expect to have it completed before winter.

Chaoyangchen-Hailungcheng Motor Service.—From the 17th inst., a taxi service is being run between Chaoyangchen and Hailungcheng, the terminus of the new Hailungcheng line, Manchuria. The fare costs $12. Heretofore, a trip from Tiehling to Chaoyangchen took at least 4 days, but, by the opening of the new railway and the taxi service, a trip can be accomplished in one day.

Steam Navigation between Chungking and Chengtu.—For the first time a steam launch has succeeded in reaching Chengtu, capital of Szechuen province, sailing up the Yangtze from Chungking. The launch, named Tienchwan is owned by a transportation company newly organized by Szechuen merchants. The vessel draws 4 feet and has a speed of 14 miles per hour. The engines burn kerosene oil.

Paiyintala-Kailu Motor Service.—From October 15 a taxi service is being run between Paiyintala and Kailu (Inner Mongolia) with a couple of Ford 7-seaters. The fare is $5 each. A younger brother of Liut.-Gen. Kan Chao-hsi, ex-Military-Governor of Jehol, has laid out $30,000 to finance the enterprise under the style Yungan Taxi Co. Another scheme to open a taxi line from Paiyintala to Lupei is being considered.

New Railway Licenses.—Shin Keihan Tetsudo K. K.—Extension of line into the City of Kyoto, 1 mile underground, estimated cost Y. 8,000,000.

Osaka Tetsudo K. K.—Nagano Machi to Kawakami Mura, Osaka Prefecture, 2 miles, estimated cost Y.670,000.

Kunhoku Tetsudo K. K.—From Shitakara Mura, Kushiro, to Kita Mitsubetsu Mura, Kushiro, Hokkaido, length 44 miles, estimated cost of construction Y.5,000,000.

Seino Denki Tetsudo K. K.—From Gifu City to Imao Machi and Kawanami Mura to Kuromata Machi and Sanshira Mura to Minami Kuise Mura, total 15 miles estimated cost Y.650,000.

Naigai Wata K. K.—The Y.50 paid in shares of the Naigai Wata K. K. (Naigai Cotton Company, Ltd.) are now quoted at between Y.76 and Y.77 and the Y.37.50 paid in shares at Y.62. At these prices the shares yield 7.8 per cent. on old and 7.3 per cent. on new, which is a good rate for a company whose dividend rate is not likely to decrease and has a good chance for increase. Reserves at the end of the first half of this year amounted to Y.18,050,992 against a paid-in capital of Y.13,250,000. The fixed capital amounted to Y.21,083,477 and liquid and semi-liquid capital Y.10,217,515. Fixed capital covers 437,000 spindles (including doublers and looms in terms of spindles) or 33 spindles per Y.1,000 of paid-in capital, while there is Y.327 of working capital for each Y.1,000 of paid-in capital. A comparison with other companies is as follows:

	Equipment per Y.1,000 of Paid-in Capital	Working Capital per Y.1,000 paid-in Capital
Toyo Boseki ..	29.5 spindles	Y.1,157
Dai Nihon Boseki	21.4 ,,	778
Godo Boseki ..	21.8 ,,	1,447
Naigai Wata ..	33.0 ,,	300

If the operation of the Naigai Wata mills is not interrupted the company should be able to pay a dividend at the same rate as Toyo Boseki or 25 per cent. as the present rate of 12 per cent. is due to labor troubles in the Shanghai Mills.

Strikes at the Shanghai and Tsingtao mills of the company has been the cause of the slump in business. The political situation in China gives little hope of early settlement of this difficulty and interruptions in operation are to be expected. During the present term the company suffered from the usual strikes but was still able to increase profits, at least enough to continue a dividend of 12 per cent. As the market is not expected to become any worse than during the present term, and as the financial position of the company is sound, it is probale that a 12 per cent. dividend will be maintained for some time, while any improvement will enable the company to increase this rate.

Mukden Electric Wires to be Underground.—The management of the Mukden Electric Light Plant has decided to replace the high tension overhead wires with underground cables so as to avoid accidents caused by damage or destruction of the wires in bad weather.

Hanshin Kokudo Denki Kido K.K.—The general meeting of shareholders of Hanshin Kokudo Denki Kido K.K. (Hanshin Highway Electric Tramway Company, Ltd.) held on October 24 approved a dividend for the term at the rate of 5 per cent. a year. The Special Managing Director ? Mr. Ishizaki, stated that the company would be merged in the Hanshin Denki Tetsudo K.K. in the near future.

Shinyetsu Chisso Hiryo K.K.—The installation of equipment purchased from the Kagami factory of Nihon Chisso Hiryo for nitrogen fixation has recently been completed. New electrical equipment purchased from the Shibaura Engineering Works includes three 10,000 kva transformers and three 6,000 kva transformers as well as switchboards.

The transmission of power from the Takazawa Power Plant of the Shinano Denki K.K., located about 28 miles from the Shinyetsu Chisso factory, has been started with satisfactory results.

Tientsin-Tangku Motor Road.—In order to facilitate commercial transportation a motor road between Tientsin and Tangku is being planned by the Chinese municipal authorities of Tientsin. The road will be thirty-five miles in length and will cost some $100,000, to be raised in local mercantile circles. *Note*—The silting up of the Haiho compels many vessels to discharge cargo and land passengers at Tangku, instead of at Tientsin as heretofore. As railway facilities are limited the new road will provide a welcome additional means of transportation.

Oguchigawa Development of Toyama Prefecture.—The Oguchigawa Power Station was originally planned by the Chuyetsu Suiryoku Denki and was taken over by the Toyama Prefecture Electric Bureau with that company. The project was abandoned for a time, but the Prefecture is now receiving estimates for the necessary equipment and evidently expects to complete the station.

The Oguchigawa Station will be a very high head plant, the head of water being only slightly less than at the Magawa Station of Toyama Prefecture. For this reason the turbines and penstocks will probably be purchased from foreign makers, the requirements being two turbines of 7,000 kw. The seven transformers, switching apparatus and other auxiliary electric equipment will be made in Japan.

Comparison of Cotton Spinning Companies with last Year.—The Japan Cotton Spinners' Association reports that the average dividend rate paid by the forty-nine members of the organization averaged 14.5 per cent. for the first half of 1927 as compared with 14.8 for the second half of 1926. The peak of the industry in the first half of 1918 reported an average dividend of 52.7 per cent.

The totals and averages of the members of the association as compared with last year are as follows:

	1st half 1927	*2nd half 1926*
Number Companies Reporting	49	50
Authorized Capital	Tls. 467,355,000	Tls. 492,387.000
Paid-in Capital..	342,265,000	357,495,000
Reserves	227,372,000	224,027,000
Debentures and Loans ..	70,318,000	74,949,000
Fixed Capital	434,314,000	466,676,000
Depreciation for the Term ..	4,462,000	4,412,000
Surplus Brought Forward ..	45,312,000	46,631,000
Net Profit for Term	26,992,000	29,957,000
Dividends Paid	24,914,000	26,484,000
Placed to Reserves	4,760,000	4,858,000
Surplus Carried Forward ..	42,634,000	45,245,000
Rate of Dividend a Year ..	14.5%	14.2%

The decline in profits is due to the drop in raw cotton during 1926 and 1925, the panic in April and May, political situation in China affecting the export trade, etc. Results for the second half of this year are expected to be better as some companies will profit by the rise in raw cotton.

Agatsumagawa Denryoku K.K.—The long contemplated merger with the Dai Ni Agatsumagawa Denryoku, (No. 2 Agatsumagawa Electric Power Co.,) a subsidiary of this company, organized to undertake certain construction work on sites belonging to the parent concern, was approved at the General Meeting of shareholders on October 19. The paid-in capital of the Agatsumagawa Denryoku has accordingly been increased to Y.8,625,000.

Kumagawa Denki K.K.—It is reported that the construction of the new Shinbashi Automatic Hydro-electric Power Station of this company, being built at the conflux of the Echiro and Yuyama Rivers at Minakami Mura in Kumamoto Prefecture, will soon be completed. The waterway is 6,000 feet long from the Yuyama river, and 3,600 feet from the intake on the Yuyama River: the total quantity of water delivered to the turbine is 240 cu. ft. a second, effective head 130 feet.

Sanriku Suiden K.K.—The Sanriku Suiden K.K. (Sanriku Hydro-electric Company, Ltd.), a new company, is now being promoted by Choemon Kikuchi (President of Miyako Denki K.K.) and Kisaburo Tohana (President of Kariya Denki K.K.) to develop hydro-electric power on the Hei River at Kawai Mura, Shimo Hei Gun, Iwate.

Two power stations with a combined capacity of 6,344 kw. will be built at an estimated cost of Y.1,565,000. Contracts for the supply of the power to be generated have already been made with the Miyako Denki, Otsuchi Denki, and the Kariya Denki.

Keihan Denki Tetsudo K. K.—This company has recently contracted to buy the Keihan Jidosha K.K. of Fushimi Machi, Kyoto Prefecture, (Keihan Automobile Co., Ltd.) which is capitalized at Y.120,000, all paid in, at the amount of its paid-in capital. This automobile company operates a bus service between the Fushimi Momoyama Station on the Keihan line, and the Momoyama Mausoleum of the Emperor Meiji. The final decision to purchase will be made at the general meeting of shareholders on October 29, 1927.

Nippon Denki Teppan K. K.—(Japan Electrolitic Steel Sheet Co., Ltd. Installation of factory equipment is completed. Trial operation will begin October 15, and actual production begun before the end of this month. Thereafter it will not be long before this company's products come into the market further complicating the iron and steel situation in this country.

Nippon Keori K.K.—It is reported that the Nippon Keori K.K. (Nippon Woollens Co., Ltd.) is to build a dye manufacturing plant to turn out dyes for its own use and to make the firm independent of the German supply, except for a few special colors. The Nippon Keori has been using domestic dyes amounting to 40 per cent. of the total consumed and has been having trouble with goods not up to sample in strength or color shade.

The present plan is the result of this trouble. The dye factory will probably be constructed in Nagoya, where the company has recently built a Rayon manufacturing plant.

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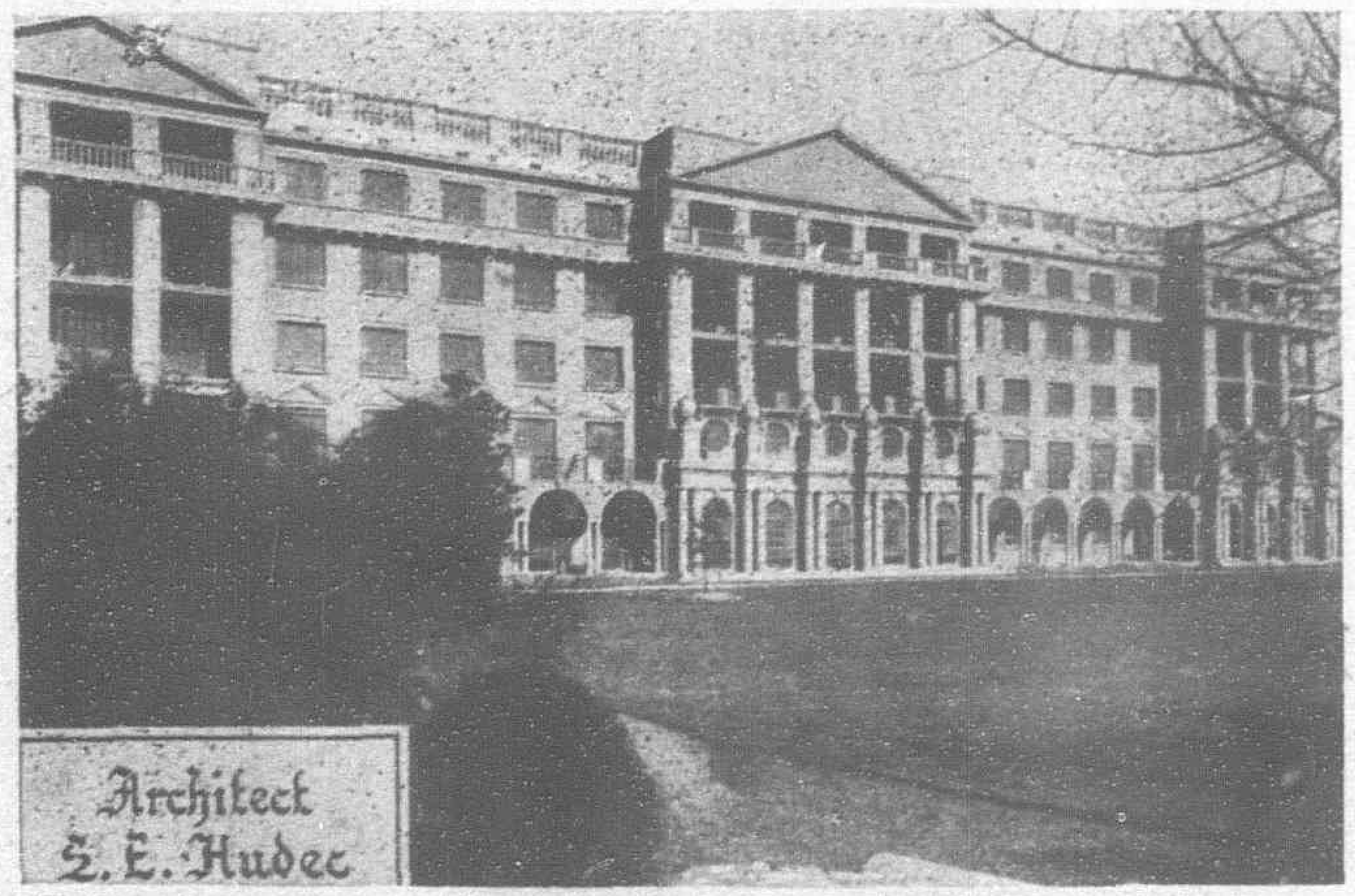

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